VALVES AND FITTINGS FOR ALL PRESSURES AND PURPOSES

CATALOGUE No. 51
JUNE, 1923

CRANE CO.
301 BRANNAN STREET
SAN FRANCISCO, CAL.

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CATALOGUE No. 51
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The telegraph code words underneath the illustrations, etc., in this book, in conjunction with those shown on pages 722 to 724, may be used to shorten messages in communicating with us. For example:

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Ship at once by express, 25—2½-inch No. 461 Standard Wedge Gate Valves Flanged, Faced and Drilled.

It is not intended to cover everything listed in this catalogue with code words, but we have compiled a complete Code Book covering all goods and sizes illustrated or listed in this catalogue, which will be sent on request to those who have use for it.

The code words in this catalogue will serve as an index to the complete Code Book, as all other words applying to sizes and different styles of goods, will be found in alphabetical order.

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1140	202
1141	202
1142	202
1144	185
A1144	186
1146	185
1148	185
A1148	186
1150	185
1152	181
1158	185
1160	181
1164	181
1165	182
1165V	182
1165	62
1165V	62
1166	62
1166V	62
1166	182
1166V	182
1167	182
1167V	182
1167	62
1167V	62
1180	194
1181	194
1182	194
1183	194
1241H	201
1501	504
1501½	506
1503	504
1503½	506
1504	505
1504½	505
1505	505
1505½	505
1506½	513
1507	512
1507½	513
1508½	512
1509	512
1509½	513
1510½	510
1511	508
1513	509
1515	507
1515	508
1517	509
1519	508
1519¼	508
1519½	507
1519½	509
1519¾	509
1521	514
1523	515
1525	516
1527	517
1530	518
1532	518
1534	518
1538	518
1539	518
1540	518
1545	520
1547	520
1549	521
1551	521
1553	522
1554	521
1555	522
1557	522
1559	528
1561	528
1562	527
1564	527
1570	527
1572	527
1573½	531
1574	529
1574½	529
1575	529
1575½	529
1575¾	530
1578	531
1579	530
1580	536
1581	530
1582	523
1582½	523
1583	523
1583½	523
1584	523
1585	525
1586	531
1586¼	531
1586½	538
1587	538
1589	524
1591½	524
1594½	540
1595	541
1596	539
1596½	539
1800	34
1801	34
1803	33
1805	33
1811	33
1813	33
1838	211
1843	211
1844	211
1846	211
3041H	201
3043H	237
4063	23
4064E	31
4065E	31
4067E	48
4170	23
4176	22
4177	22
4186E	30
4187E	30
4270	23
4382	225
4383	225
4387	245
4389	245
4435	48
4435	41
4451	23

PRINTED IN U. S. A.
BY
HILLISON & ETTEN CO.
CHICAGO

DISTINGUISHING MARKS

The name—**CRANE**—is the adopted marking which will distinguish nearly all goods made by this Company.

Exceptions to the above markings are as follows:

Brass Goods such as Steam, Gas and Water Cocks are marked CC.

Standard lines of Malleable and Cast Iron Screwed Fittings and Forged Steel Screwed Fittings are marked C.

Certain other goods such as Unions, Union Elbows and Tees, in addition to the mark C, have specific marking, viz:

CHICAGO, RAILROAD, NAVY, ETC.

Cast Steel Valves and Cast Steel Flanged Fittings are marked

CRANE
STEEL
卐

Cast Steel Screwed Fittings are marked with **CRANE** or **C** on one side and 卐 on the other.

Forged Steel Valves have **CRANE** on the center piece and **C** on the body.

MARKING WORKING PRESSURES

Respective pages in this catalogue representing various goods, specifying the Working Pressures as applying either to the entire line (regardless of sizes) or mention the specific working pressure for which each size is recommended.

To further complete and perfect this system, all articles bearing the distinguishing mark—**CRANE**—will also have their respective Working Pressure plainly stamped or cast on each article, and is to be understood as meaning:

THE WORKING PRESSURE FOR WHICH THEY ARE INTENDED.

This marking should not be misconstrued to mean Test Pressure.

IMPORTANT EXPLANATORY NOTICE WITH REFERENCE TO CHANGE IN MARKING

We formerly marked some of our Valves and Fittings, showing "TEST PRESSURES," but have concluded it best to mark them with the "WORKING PRESSURES" instead. For instance, Extra Heavy Valves and Fittings which were formerly marked **CRANE 800** (indicating test pressure) are now marked **CRANE 250,** meaning **steam working pressure.** This new marking does not in any respect alter the construction or affect the quality of the goods.

PROPORTIONATE WATER WORKING PRESSURES IRON MATERIAL

For most of the material suitable for water, the water working pressure is given on the Catalogue page in connection with the steam working pressure.

For convenience in determining the approximate or admissible Water Working Pressures to which Valves and Fittings may be subjected, proportionate to or based on the designated Steam Working Pressures, we suggest the following conservative rule, to use when the water working pressure is not given on the Catalogue page, although a much greater range may be safely used with comparatively small sizes of Valves and Fittings.

Low Pressure, Standard and Medium Valves and Fittings will stand a Water Working Pressure 40 per cent greater than the Steam Working Pressure on sizes 12 inch and smaller; and sizes 14 inch and larger will stand 20 per cent greater Water Working Pressure than the Rated Steam Working Pressure.

Material rated for 250 pounds steam working pressure and usually designated as Extra Heavy, will stand a water, oil or gas working pressure of 400 pounds on sizes 8 inch and smaller, and 350 pounds on sizes 9 inch and larger.

CRANE METALS

In order to insure a uniform and reliable product Crane Co. maintains complete laboratories for making chemical, physical and metallographic analyses and tests of the materials which it uses. Daily analyses are made of the raw materials used, and the tensile and transverse strengths, ductility, etc., of Gray Iron, Ferrosteel, Malleable Iron and Cast Steel are regularly determined. These results are recorded and furnish invaluable data for maintaining a uniform product.

Crane Co. also has a special testing department in which investigations are conducted as to the merits of Crane goods to meet not only present requirements but also special conditions as they arise. Complete facilities are provided for duplicating almost any service to be met with, consequently recommendations made for our various lines of goods may be safely followed as they are based on actual performance.

We give below some of the characteristics of the metals regularly used in the articles illustrated on the following pages.

CRANE HARD METAL

This is a pure copper-tin Bronze of high strength and hardness which years of satisfactory service have proved thoroughly reliable for valves and fittings for use with high pressures under extremely severe conditions. Its hardness and average tensile strength of 40,000 pounds per square inch make it an exceptionally desirable material for valves, valve seats and discs to withstand severe service.

CRANE SPECIAL BRASS

Crane Special Brass is a high grade steam metal which has been found most desirable for use where conditions call for a superior valve metal, and in view of the satisfactory service which it has given to thousands of users we have no hesitation in recommending it.

CRANE STEM METAL

To procure a metal to withstand the great torsional and tensile strains to which valve stems are subjected, Crane Co. has developed "Crane Stem Metal" which is now used where "cast bronze" stems were formerly called for. This material has an average tensile strengeh of 55,000 pounds per square inch.

CRANE GRAY IRON

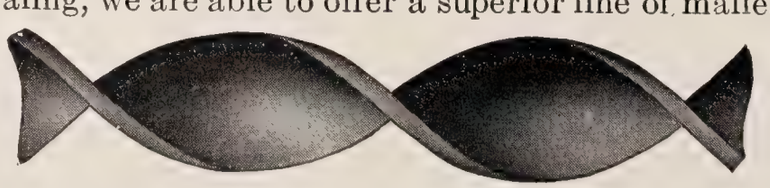
Through constant application of scientific control in the choice of materials, their mixture and making into molten metal, Crane Co's. Gray Iron has long been held to a high standard. It has an average tensile strength of 22,500 to 25,000 pounds per square inch. With this strength goes a uniformity and a softness which makes it particularly adaptable to the manufacture of Cast Iron Valves and Fittings.

CRANE FERROSTEEL

This material, which is 50 per cent stronger than Gray Cast Iron, is regularly used for the larger sized valves and fittings in which close grain and strength are most needed. Its close grain makes it particularly valuable for lines which are to convey ammonia and other gases and high pressure steam.

CRANE MALLEABLE IRON

Crane Malleable Iron has a tensile strength of from 40,000 to 50,000 pounds per square inch. By the application of improved methods in furnace practice, casting and annealing, we are able to offer a superior line of malleable iron goods.



As a part of our regular routine control in the production of malleable iron and the annealing of the articles made from it, we illustrate a torsional test bar, one of which is made half-hourly during each day's run.

CRANE CAST STEEL VALVES AND FITTINGS

It has been shown by our tests of various metals at high temperatures and also by the experience of many users, that the modern power plant requires for valves and fittings the strongest and best metal available. This means Crane Cast Steel, for, while our cast iron, ferrosteel and other alloys are quite satisfactory for the lower pressures and temperatures of saturated steam, the very extensive present use of superheated steam at temperatures of 550 to 700 degrees F. and the recent developments in oil refining (cracking temperatures around 900 degrees F.) practically compel the use of cast steel for efficient operation and permanence.

Crane Co. has a thoroughly modern steel foundry, including an electric furnace equipment and every facility for prompt and high grade service. Our Cast Steel valves and fittings are of approved design; they are made from materials, melted and refined under strict chemical control; expert foundry and machine shop work, followed by careful assembling and testing, complete a cycle of operations which insure a cast steel product second to none in this or any other country.

STANDARD REQUIREMENTS FOR HIGH GRADE STEEL CASTINGS

Ordinarily the metal from which steel castings is poured must comply with the following minimum requirements:

	Usual Requirements	Crane Electric Cast Steel
Tensile strength per square inch	60,000 lbs.	65,000-85,000 lbs.
Elastic limit per square inch	30,000 lbs.	35,000-45,000 lbs.
Elongation in two inches	20%	22-35%
Reduction of Area	25%	35-45%
Cold Bend	90°	90°-180°

REQUIRED TEST

USUAL CRANE TEST

CRANE TENSILE TEST BAR BEFORE AND AFTER TEST

A 90° or 120° bend is required by leading Engineers. Our bars often stand bending 180°.

These cuts represent a bar of Cast Steel one inch square, bent cold without cracking or distress.

Careful and accurate annealing is necessary to relieve cooling strains and remove brittleness. All Crane Steel Castings are annealed in furnaces fitted with recording pyrometers.

MONEL METAL

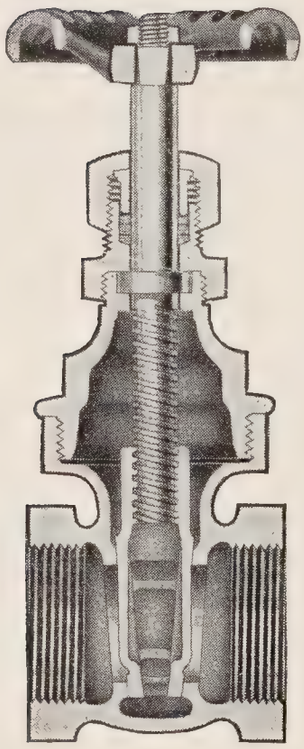
Valve discs and seat rings must be made of a non-corrosive material, which has the same expansion and contraction as the metal of which the valve is made. Seat and disc rings for Crane Cast Steel Valves are made of Monel Metal which is highly non-corrosive and the highest grade metal known for this service. The rings will not loosen from the expansion and contraction of the metals under either saturated or superheated steam temperatures.

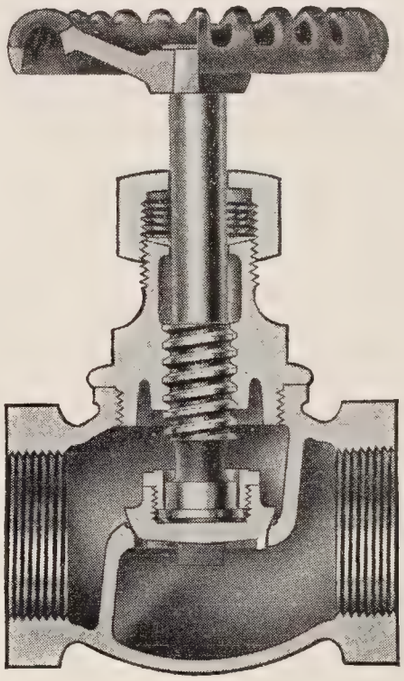
Extensive tensile and torsional tests, covering all temperatures met with in steam engineering practice, have demonstrated the great superiority of rolled Monel Metal as a material for stems. Its high resistance to corrosive influences and its high elastic limit under both tension and torsion, make it particularly serviceable and it is furnished regularly in Crane Cast Steel Valves.

CRANE CO.

BRASS VALVES

GLOBE, ANGLE, CROSS AND CHECK





MERITS OF BRASS VALVES

These Valves are well proportioned, are of good weight, and sufficiently strong to stand the steam working pressures as given on the following pages.

They are thoroughly tested under steam pressure before leaving the factory.

The question is constantly being raised as to what material in Valves and weight of Valves are suitable for the different pressures that are used in engineering practice. In many cases ordinary Standard Valves are used for high pressures and likely they are sufficiently strong to stand the working pressures, as we have at various times subjected them to a hydraulic pressure of 500 to 1,000 pounds without leaking; but, as stated above, we do not recommend them for more than the steam working pressure as specified on the following pages.

It is not only a question of the Valve standing a higher pressure, but also standing the strain of expansion, contraction, weight of piping and settling, also the cutting effect of the steam on the disc and seat.

It is, however, possible that the Standard Valves might be reasonably satisfactory for higher working pressures, provided the expansion, contraction, weight of piping and settling were all taken care of.

The construction of our Standard Stop Valves (Globe and Angle) is such that they may, when wide open, be repacked while under pressure.

All users of Valves will appreciate the advantage in being able to repack a Valve without shutting off steam, as it frequently happens that it is necessary they be used continuously.

LOW PRESSURE

GLOBE AND ANGLE VALVES

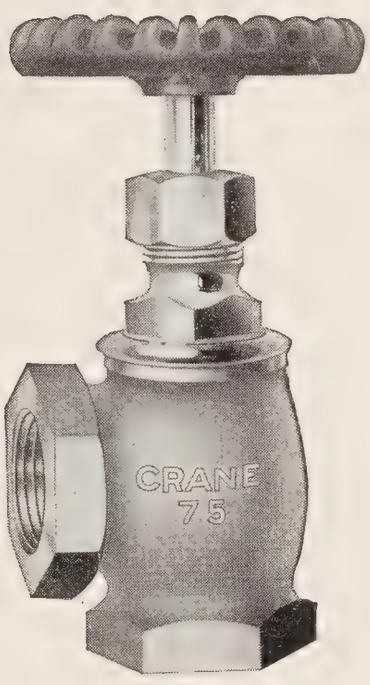
AND

HORIZONTAL CHECK VALVES

BRASS

FOR STEAM WORKING PRESSURES UP TO 75 POUNDS.

NO. 1-B GLOBE
CODE: ABAHULAVAM



NO. 2-B ANGLE
CODE: ABALISADA

NO. 20-B HORIZONTAL CHECK
CODE: ABANDONOME

Size.....Inches	*⅜	½	¾	1	1¼	1½	2
Size.....Millimeters	10	13	19	25	32	38	50
Globe or Angle.....Each	.77	1.00	1.26	1.80	2.52	3.50	5.30
Check.....Each	.70	.90	1.15	1.60	2.25	3.15	4.75

*⅜ inch No. 20-B Check Valves are made Ball Disc Type.

Although these Valves are lighter than our Nos. 1, 2 and 20, Standard Valves, they are equal in weight to many valves termed "Standard" by other manufacturers.

The increased use of piping material in homes, small factories, farms, garages, water systems, etc., where the pressure does not exceed 75 pounds per square inch, has created a demand for these valves.

The Globe and Angle Valves when wide open may be repacked while under pressure.

STANDARD

GLOBE, ANGLE AND CROSS VALVES

BRASS

FOR STEAM WORKING PRESSURES:

SIZES 3-INCH AND SMALLER, UP TO 125 POUNDS
SIZES 3½ AND 4-INCH, UP TO 100 POUNDS

No. 1 GLOBE

CODE: ABAREGADO

No. 2 ANGLE

CODE: ABDIDERAM

No. 18 CROSS

CODE: ABDUCOR

Size.....Inches	⅛	¼	⅜	½	¾	1	1¼
Size.....Millimeters	3	6	10	13	19	25	32
No. 1, Globe.....Each	.72	.72	.77	1.00	1.26	1.80	2.52
No. 2, Angle.....Each	.72	.72	.77	1.00	1.26	1.80	2.52
No. 18, Cross.....Each		1.25	1.25	1.50	2.00	2.50	3.50

Size.....Inches	1½	2	2½	3	3½	4	
Size.....Millimeters	38	50	64	76	90	100	
No. 1, Globe.....Each	3.50	5.30	10.00	14.40	26.50	36.00	
No. 2, Angle.....Each	3.50	5.30	10.00	14.40	26.50	36.00	
No. 18, Cross.....Each	5.00	8.00	16.00	24.00			

These Valves, when wide open, may be repacked while under pressure.

FOR DESCRIPTION OF THESE VALVES, SEE PAGE 4

STANDARD

CHECK VALVES

HORIZONTAL, ANGLE AND VERTICAL

BRASS

FOR STEAM WORKING PRESSURES:
SIZES 3 INCH AND SMALLER, UP TO 125 POUNDS
SIZES 3½ INCH AND 4 INCH, UP TO 100 POUNDS

No. 20 HORIZONTAL
CODE: ABEJON

No. 26 ANGLE
CODE: ABFACHEN

No. 20 AND No. 21 HORIZONTAL

Size.....Inches	*⅛	*¼	*⅜	½	¾	1	1¼
Size.....Millimeters	3	6	10	13	19	25	32
No. 20, Horizontal, Screwed.....Each	.65	.65	.70	.90	1.15	1.60	2.25
No. 21, Horizontal, Flanged.....Each					4.90	6.50	8.25
Diameter of Flanges.....Inches					3½	4	4½
Size.....Inches	1½	2	2½	3	3½	4	
Size.....Millimeters	38	50	64	76	90	100	
No. 20, Horizontal, Screwed.....Each	3.15	4.75	9.00	13.00	24.00	32.50	
No. 21, Horizontal, Flanged.....Each	10.15	15.50	22.00	33.50	47.50	66.50	
Diameter of Flanges.....Inches	5	6	7	7½	8½	9	

*These sizes are ball disc type.

No. 26 ANGLE

Size.....Inches	*⅛	*¼	*⅜	½	¾	1	1¼	1½	2	2½	3
Size.....Millimeters	3	6	10	13	19	25	32	38	50	64	76
Price, No. 26, Angle, Screwed.....Each	.72	.72	.77	1.00	1.26	1.80	2.52	3.50	5.30	10.00	14.40

*These sizes are ball disc type.

These Check Valves have the same proportions as our Standard Globe and Angle Valves.

Templates for drilling, page 595. Price List for drilling, page 483.

No. 24, VERTICAL

Size.....Inches	*⅛	*¼	*⅜	½	¾	1
Size.....Millimeters	3	6	10	13	19	25
Price, No. 24, Vertical Screwed.....Each	.72	.72	.77	1.00	1.26	1.80
Size.....Inches	1¼	1½	2	2½	3	
Size.....Millimeters	32	38	50	64	76	
Price, No. 24, Vertical, Screwed.....Each	2.52	3.50	5.30	10.00	14.40	

*These sizes are ball disc type.

The vertical Check Valve is for use in lines with upward flow. It is installed with the inlet side down.

No. 24 VERTICAL
CODE: ABGABEN

STANDARD

HORIZONTAL CHECK VALVES

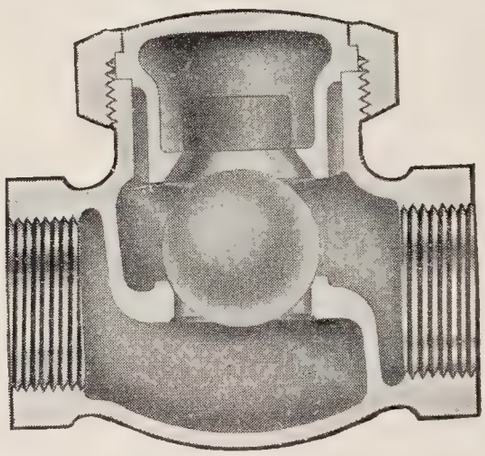
BRASS

THESE VALVES ARE RECOMMENDED FOR STEAM WORKING PRESSURES AS FOLLOWS:

No. 28 UP TO 125 POUNDS
No. 31 UP TO 150 POUNDS

No. 28 WITH DRIP COCK

CODE: ABJECTIF

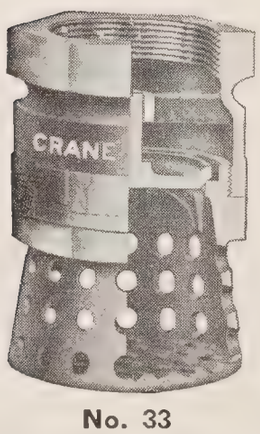


No. 31 BALL DISC TYPE

CODE: ABJURABA

Size.....Inches	½	¾	1	1¼
Size.....Millimeters	13	19	25	32
No. 28, with Drip Cock.....Each	2.15	2.55	3.15	4.05
No. 31, Ball Disc Type.....Each	1.60	2.40	3.60	5.60

For Ball Check Valves, sizes ⅛, ¼ and ⅜-inch, see No. 20 on page 7.
No. 31 furnished with Drip Cock at an extra price.
No. 31 has Union Bonnet and Malleable Iron Union Ring.
1½ and 2-inch Ball Check Valves made to order.



No. 33
CODE: ABKNICKUNG

BRASS FOOT VALVES

WITH STRAINER

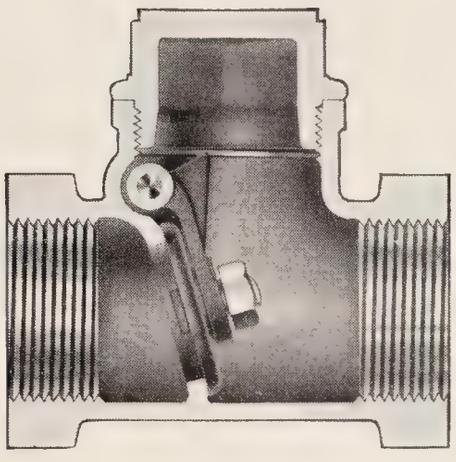
FOR WATER WORKING PRESSURES UP TO 175 POUNDS

Size.....Inches	½	¾	1	1¼
Size.....Millimeters	13	19	25	32
Price.....Each	1.50	1.50	2.00	2.75
Size.....Inches	1½	2	2½	3
Size.....Millimeters	38	50	64	76
Price.....Each	3.75	5.50	12.00	16.00

For Iron Foot Valves, see Pages 125 and 126.

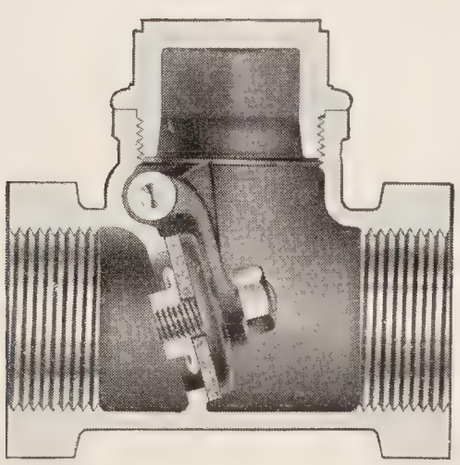
STANDARD
SWING CHECK VALVES
BRASS

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS
FOR WATER WORKING PRESSURES UP TO 175 POUNDS



No. 34
BRASS DISC
CODE: ABLANDISCH
MAY BE USED IN A HORIZONTAL POSITION OR FOR UPWARD FLOW

Size.....Inches	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3
Size.....Millimeters	10	13	19	25	32	38	50	64	76
No. 34.....Each	1.80	2.00	2.25	2.80	3.65	4.75	6.75	15.00	24.00



No. 34 1/2
LEATHER DISC FOR COLD WATER SERVICE ONLY
CODE: ABROGASSEM
MAY BE USED IN A HORIZONTAL POSITION OR FOR UPWARD FLOW

Size.....Inches	3/8	1/2	3/4	1	1 1/4	1 1/2	2
Size.....Millimeters	10	13	19	25	32	38	50
No. 34 1/2.....Each	2.40	2.65	2.90	3.60	4.65	6.00	8.25

Valves for cold water preferably should have Leather Discs. For hot water or steam, Brass Discs should be used.

STANDARD

FLANGED GLOBE AND ANGLE VALVES

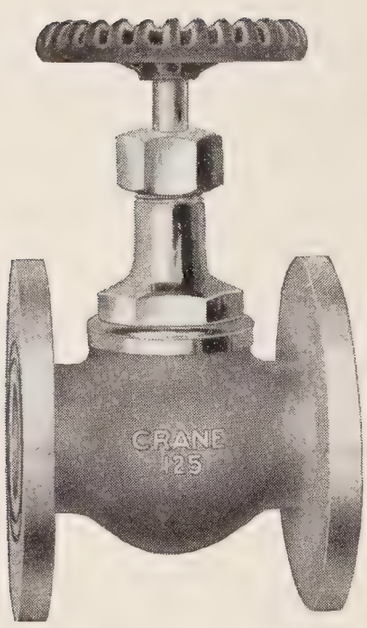
BRASS

WITH A GLAND IN THE STUFFING BOX

FOR STEAM WORKING PRESSURES

SIZES 3-INCH AND SMALLER, UP TO 125 POUNDS

SIZES 3½ AND 4-INCH, UP TO 100 POUNDS



No. 3 GLOBE

CODE: ABSENTETUR

No. 3 ANGLE

CODE: ABSONORUM

Size.....Inches	⅜	½	¾	1	1¼	1½
Size.....Millimeters	10	13	19	25	32	38
Price.....Each	4.00	4.50	5.00	6.75	8.50	10.50
Center to Face, Angle.....Inches	1¾	2	2¼	2½	2⅞	3 3/16
Face to Face, Globe.....Inches	2½	2¾	3⅛	3⅝	4⅛	4⅝
Diameter of Flanges.....Inches	2½	3	3½	4	4½	5
Size.....Inches	2	2½	3	3½	4	
Size.....Millimeters	50	64	76	90	100	
Price.....Each	16.00	23.00	35.00	50.00	70.00	
Center to Face, Angle.....Inches	3¾	4 5/16	4⅝	5¼	5½	
Face to Face, Globe.....Inches	5½	6⅜	7½	7⅞	8⅜	
Diameter of Flanges.....Inches	6	7	7½	8½	9	

These Valves, when wide open, may be repacked while under pressure.
In ordering, be particular to specify whether Globe or Angle are wanted.
Templates for drilling, page 595. Price List for drilling, page 483.

STANDARD
GLOBE AND ANGLE VALVES

BRASS

SPECIAL WHEELS AND FINISH

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS

No. 6. GLOBE
CODE: ACABABA

No. 8. GLOBE
CODE: ACHULADA

No. 6. WOOD WHEEL

Size.....Inches	¼	⅜	½	¾
Size.....Millimeters	6	10	13	19
Price, Rough Body, Plain.....Each	1.15	1.25	1.40	1.75
Price, Rough Body, Plated all over.....Each	1.40	1.55	1.70	2.10
Price, Finished all over.....Each	1.85	2.00	2.15	2.50
Price, Finished and Plated all over.....Each	2.15	2.30	2.45	2.85
Size.....Inches	1	1¼	1½	2
Size.....Millimeters	25	32	38	50
Price, Rough Body, Plain.....Each	2.35	3.25	4.35	6.85
Price, Rough Body, Plated all over.....Each	2.75	3.70	4.85	7 60
Price, Finished all over.....Each	3.25	4.35	5.75	9.00
Price, Finished and Plated all over.....Each	3.65	4.80	6.25	9.75

No. 8. FINISHED ALL OVER WITH BRASS WHEEL

Size.....Inches	¼	⅜	½	¾
Size.....Millimeters	6	10	13	19
Price, Finished all over.....Each	2.75	3.00	3.15	3.50
Price, Finished and Plated all over.....Each	3.25	3.50	3.70	4.10
Size.....Inches	1	1¼	1½	2
Size.....Millimeters	25	32	38	50
Price, Finished all over.....Each	4.25	5.60	7.00	10.25
Price, Finished and Plated all over.....Each	4.90	6.30	7.75	11.25

No. 8 Valves are made to order only.

These Valves when wide open may be repacked while under pressure.

When ordering, specify whether Globe or Angle pattern is wanted, giving Valve number, size and style of finish.

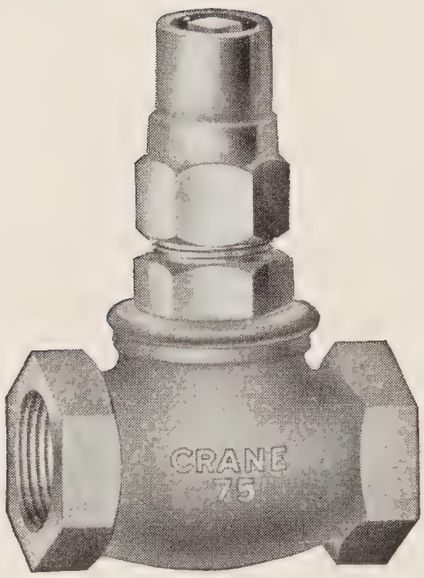
The following describes the style of finish: Rough Body Plain is the Regular Brass Valve Casting. Rough Body Plated is the Regular Brass Valve Casting Nickel Plated. Finished all over is the Brass Valve Casting, Smooth Finished and Polished. Finished and Plated is the Brass Valve Casting, Smooth Finished, Nickel Plated and Polished all over.

LOCK AND SHIELD

GLOBE AND ANGLE VALVES

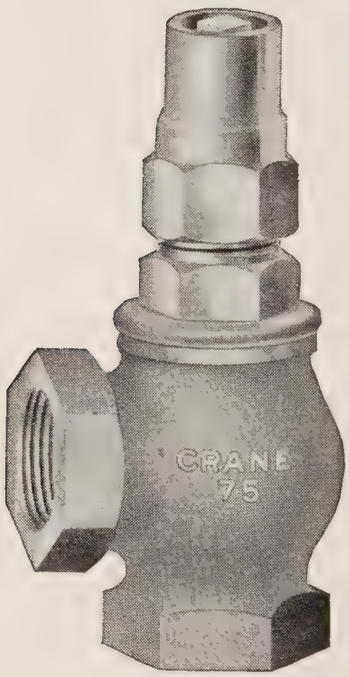
BRASS

FOR GAS



No. 48 GLOBE

CODE: ADEDALADO



No. 48 ANGLE

CODE: ADELESCHE

WHEN ORDERING, STATE WHETHER GLOBE OR ANGLE VALVES ARE WANTED

Size.....Inches	3/8	1/2	3/4	1	1 1/4
Size.....Millimeters	10	13	19	25	32
Price, Rough Body, Plain.....Each	1.10	1.35	1.60	2.25	3.25
Price, Rough Body, Plated all over....Each	1.40	1.65	1.95	2.65	3.70

These Valves regularly are made with a brass disc, ground for gas service.

Made to order with fibre disc at a special price.

Nickel Plated Valves are made to order only.

These Valves are packed ready for use.

Keys Extra; for price and description see Page 60.

NEEDLE POINT

GLOBE AND ANGLE VALVES

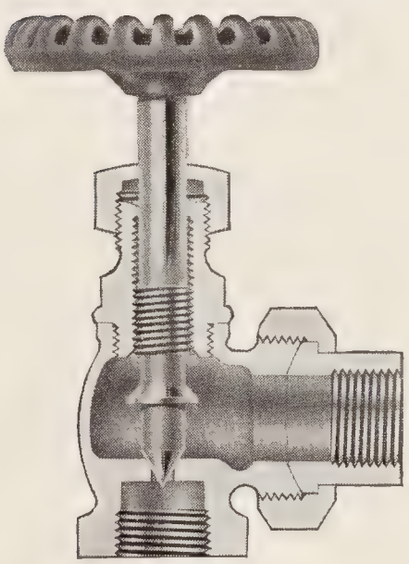
BRASS

FOR OIL WORKING PRESSURES:

SIZES ½-INCH AND SMALLER, UP TO 200 POUNDS
SIZES ¾-INCH AND LARGER, UP TO 125 POUNDS

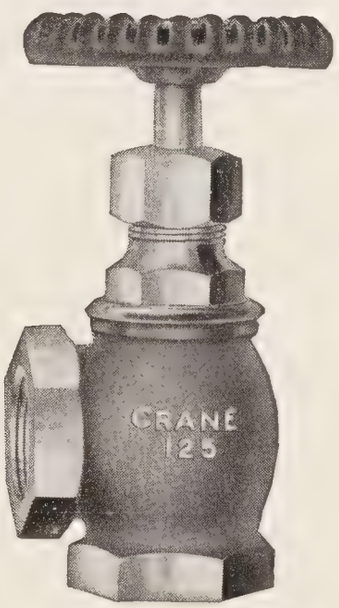
No. 60, GLOBE

CODE: ADGELABIT



No. 60. ANGLE, WITH UNION

CODE: ADHIBEAMUR



No. 60, ANGLE

CODE: ADHATODA

Size.....Inches	⅛	¼	⅜	½	¾
Size.....Millimeters	3	6	10	13	19
Size Feed Opening.....Inches	1/16	1/16	⅛	3/16	¼
Price, Globe, Female Openings.....Each	1.20	1.40	1.50	2.00	2.50
Price, Angle, Female Openings.....Each	1.20	1.40	1.50	2.00	2.50
Price, Angle, with Union.....Each	2.00	2.00	2.20	3.00	3.50

Valves are regularly furnished with feed openings as listed above. If these openings are not suitable for requirements, specify the size desired.

For High Pressure Needle Point Valves, see page 509.

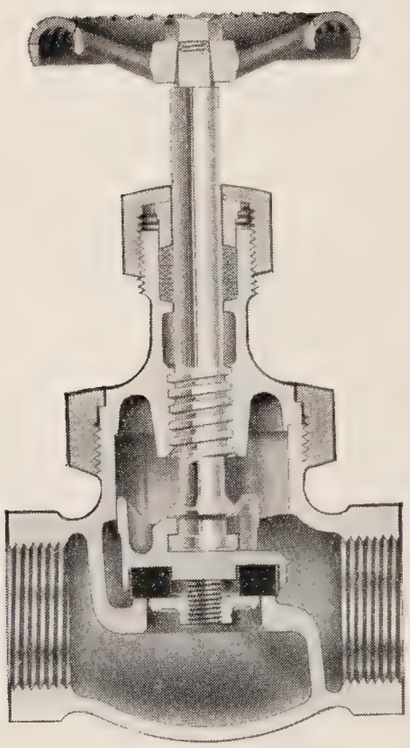
CRANE RENEWABLE DISC

GLOBE AND ANGLE VALVES

BRASS

UNION BONNET WITH MALLEABLE IRON UNION RING

FOR STEAM WORKING PRESSURES UP TO 150 POUNDS



No. 7 GLOBE PATTERN

These valves are designed to be used in plants where discs must be changed quickly without injury to the valve.

We know from experience that wheels, stuffing box nuts and union bonnet rings are likely to receive rough treatment, and therefore, have made these parts of malleable iron to give strength where the wear is the greatest.

The disc holder slips onto the stem, and is accurately guided in the body. The disc may be easily removed from and replaced in this holder.

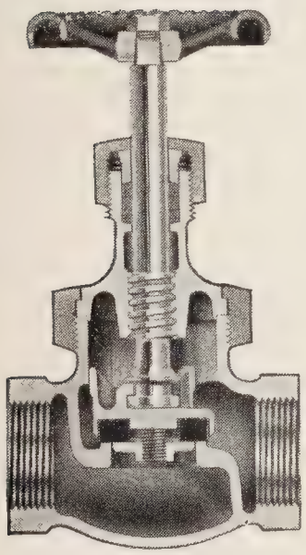
To be able to make repairs quickly, users should keep on hand a supply of the discs and holders complete. When a leak is discovered, one of these complete holders may be inserted quickly, and the old disc may be removed and a new one placed in the old holder at the convenience of the engineer.

Besides the quick change features, and the malleable iron parts, these valves have glands in the stuffing boxes, the stems have beveled shoulders which make tight seats against the bonnets, allowing the valves, when wide open, to be repacked while under pressure.

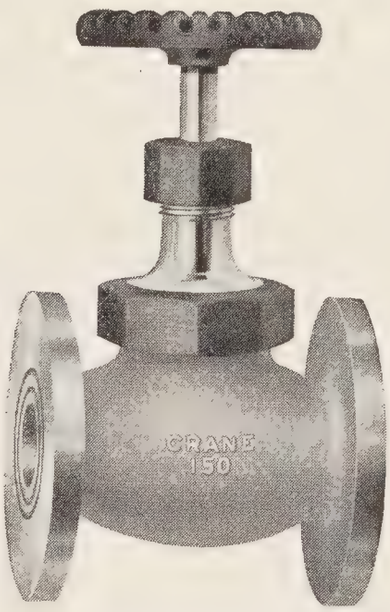
The bodies are heavier than "standard" valves.

For list price and description of discs, see page 15.

CRANE RENEWABLE DISC
GLOBE AND ANGLE VALVES
BRASS
UNION BONNET WITH MALLEABLE IRON RING
FOR STEAM WORKING PRESSURES UP TO 150 POUNDS



No. 7 GLOBE
CODE: ADJACUIMUS



No. 9 GLOBE
CODE: ADMULCO

No. 7 ANGLE
CODE: ADJUGE

IN ORDERING STATE WHETHER GLOBE OF ANGLE VALVES ARE WANTED

Size.....Inches	1/8	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3
Size....Millimeters	3	6	9	13	19	25	32	38	50	64	76
No. 7, Screwed..Ea.	1.10	1.10	1.25	1.60	2.20	2.80	4.00	5.50	8.75	15.75	22.00
No. 9, Flanged.....Each					5.00	6.00	9.00	11.00	16.50	25.00	34.00
Diam. Flanges....Inches					3 1/2	4	4 1/2	5	6	7	7 1/2
Face to Face, Globe Flanged.....Inches					3 3/4	4 3/8	4 13/16	5 1/2	6 1/2	7 1/2	8 7/8
Center to Inlet or Outlet, Angle, Flanged...Inches					2 1/4	2 1/2	2 7/8	3 3/16	3 3/4	4 5/16	4 5/8

These Valves are fitted with Crane Renewable Steam Discs, suitable for use on Saturated Steam pressures up to 150 pounds.

When Valves are wanted for hot water service, they will be furnished with Crane Renewable Hot Water Discs at the same price.

When Valves are wanted for cold water service, they will be furnished with Crane Renewable Cold Water Discs at the same price.

When these Valves are ordered for compressed air service, they are given a special test before shipping and are furnished at a special price.

CRANE STEAM DISCS ALWAYS WILL BE FURNISHED UNLESS OTHERWISE SPECIFIED.

For Extra Crane Renewable Discs, see page 17.

Flanged Valves made to order only.

Templates for drilling, page 595. Price List for drilling, page 483.

EXTRA DISC HOLDERS

Size.....Inches	1/8	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3
Size.....Millimeters	3	6	10	13	19	25	32	38	50	64	76
Disc Holder, complete. For No. 7 and No. 9 Valves (includes Holder, Disc and Disc Nut).....Each	.30	.30	.35	.40	.45	.55	.70	1.00	1.60	3.00	4.25

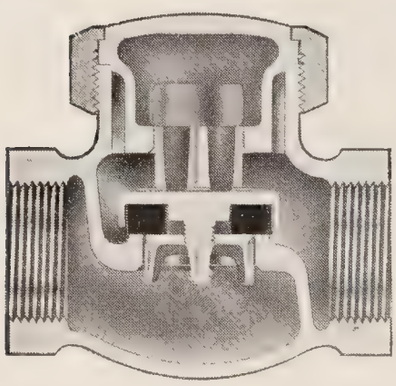
CRANE RENEWABLE DISC HORIZONTAL AND ANGLE

CHECK VALVES

BRASS

UNION BONNET WITH MALLEABLE IRON UNION RING

FOR STEAM WORKING PRESSURES UP TO 150 POUNDS



No. 27 HORIZONTAL

CODE: ADORMEADO

No. 27 ANGLE

CODE: ADORSORUM

WHEN ORDERING, GIVE VALVE NUMBER AND STATE WHETHER HORIZONTAL OR ANGLE VALVES ARE WANTED.

Size.....Inches	¼	⅜	½	¾	1	1¼	1½	2	2½	3
Size.....Millimeters	6	9	13	19	25	32	38	50	64	76
No. 27, Screwed.....Each	1.10	1.20	1.30	1.90	2.60	3.60	5.00	7.50	13.50	20.50
No. 29, Flanged.....Each				4.75	5.50	7.80	9.80	15.00	22.80	32.40
Diameter Flanges..Inches				3½	4	4½	5	6	7	7½
Face to Face, Horizontal Flanges.....Inches				3¾	4⅜	4 13/16	5½	6½	7½	8⅞
Center to Inlet or Outlet, Angle, Flanged...Inches				2¼	2½	2⅞	3 3/16	3¾	4 5/16	4⅝

These Valves are fitted with Crane Renewable Steam Discs, suitable for use on Saturated Steam pressures up to 150 pounds.

When Valves are wanted for hot water service, they will be furnished with Crane Renewable Hot Water Discs at the same price.

When Valves are wanted for cold water service they will be furnished with Crane Renewable Cold Water Discs at the same price.

When these Valves are ordered for compressed air service, they are given a special test before shipping and are furnished at a special price.

CRANE STEAM DISCS ALWAYS WILL BE FURNISHED UNLESS OTHERWISE SPECIFIED.

Flanged Valves made to order only.

For extra Crane Renewable Discs, see page 17.

Templates for drilling, page 595. Price List for drilling, page 483.

CRANE RENEWABLE DISCS

USED IN ALL CRANE VALVES WHICH HAVE THE RENEWABLE COMPOSITION DISC FEATURE

CODE: ADTAMINARE

Size.....Inches	1/8	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3
Size.....Millimeters	3	6	10	13	19	25	32	38	50	64	76
For Steam.....Each	.06	.06	.08	.08	.10	.12	.18	.24	.36	.48	.80
For Hot Water....Each	.06	.06	.08	.08	.10	.12	.18	.24	.36	.48	.80
For Cold Water...Each	.06	.06	.08	.08	.10	.12	.18	.24	.36	.48	.80

Size.....Inches	3 1/2	4	4 1/2	5	6	7	8	10	12	
Size.....Millimeters	90	100	113	125	150	175	200	250	300	
For Steam.....Each	1.00	1.20	1.40	1.60	2.00	2.40	2.80	4.50	5.00	
For Hot Water.....Each	1.00	1.20	1.40	1.60	2.00	2.40	2.80	4.50	5.00	
For Cold Water.....Each	1.00	1.20	1.40	1.60	2.00	2.40	2.80	4.50	5.00	

Crane Renewable Discs are made of compositions, each particularly adapted to the service for which it is recommended. These Discs have given satisfaction under the most severe working conditions up to 150 pounds pressure.

The Crane Steam Disc is for use on Saturated Steam Pressures up to 150 pounds.

The Crane Hot Water Disc is somewhat softer than the Steam Disc and is particularly suitable for Hot Water Service where the temperature does not exceed 225°F. These Discs are furnished when specially ordered for Hot Water Service.

The Crane Cold Water Disc is a composition particularly adapted for Cold Water and Air Service, but should not be used on Hot Water or Steam. These Discs are furnished when specially ordered for Cold Water or Air.

When complete Valves or separate Discs are ordered, Steam Discs will always be furnished, unless otherwise specified.

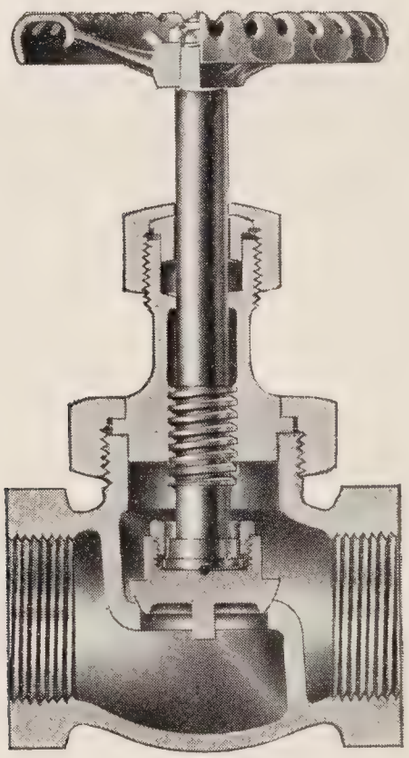
CRANE NAVY VALVES

UNION BONNET REGRINDING

GLOBE, ANGLE, CROSS AND CHECK VALVES

CRANE SPECIAL BRASS

WITH A GLAND IN THE STUFFING BOX



No. 70. GLOBE PATTERN

A Valve which can be reground while in place is almost indispensable, and Valves of this type are universally used in marine service and the navy.

This style Valve, however, offers just as many advantages to all steam users, as, apart from the regrinding feature, it is the strongest form which can be adopted. The body is reinforced by a heavy union ring, and when pressure is applied, any tendency of the body to stretch is counteracted by this ring, and the contact between the body and ring becomes more intimate as the pressure increases.

All the brass parts of these Valves are made of "Crane Special Brass," the merits of which are described on page 2.

These Valves when wide open may be repacked while under pressure.

INSTRUCTIONS FOR REGRINDING

Unscrew the Union Ring, take out the trimmings, insert a wire or nail through the hole in Disc, which locks it with the stem so that both turn together; put regrinding compound and a little oil on the Disc, replace the trimmings, leaving the large Nut or Union Ring loose enough to turn the trimmings in body; regrind by rotating the trimmings until a tight joint bearing is formed on the Seat and Disc. The hub on center piece, which also rotates in the body, guides the Stem while regrinding.

See that all regrinding compound is removed before again using Valve in service.

CRANE NAVY VALVES

GLOBE, ANGLE AND CROSS

CRANE SPECIAL BRASS

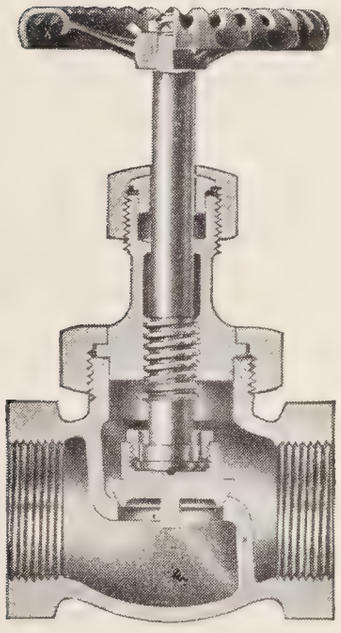
UNION BONNET REGRINDING

WITH A GLAND IN THE STUFFING BOX

FOR STEAM WORKING PRESSURES:

SIZES 1¼ INCH AND SMALLER, UP TO 225 POUNDS
SIZES 1½ TO 3 INCH, INCLUSIVE, UP TO 200 POUNDS
SIZES 3½ AND 4 INCH, UP TO 175 POUNDS

TESTED TO 250 POUNDS HYDRAULIC PRESSURE PER SQUARE INCH



No. 70 GLOBE

CODE: ADUNQUE

No. 70 ANGLE

CODE: ADVISJACHT

Size.....Inches	⅛	¼	⅜	½	¾	1	1¼
Size.....Millimeters	3	6	10	13	19	25	32
No. 70, Globe or Angle, Screwed. Each	1.30	1.30	1.50	1.90	2.50	3.50	5.00
No. 74, Cross, Screwed.....Each				2.65	3.50	4.75	6.00
Size.....Inches	1½	2	2½	3	3½	4	
Size.....Millimeters	38	50	64	76	90	100	
No. 70, Globe or Angle, Screwed. Each	7.00	11.00	20.00	29.00	45.00	65.00	
No. 74, Cross, Screwed.....Each	9.00	14.00	28.00	42.00			

For description and directions for regrinding, see page 18.
In ordering, state whether Globe, Angle or Cross Valves are wanted.

CRANE NAVY VALVES
GLOBE, ANGLE AND CROSS

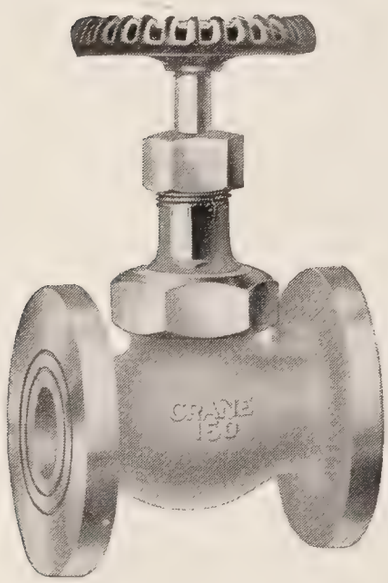
CRANE SPECIAL BRASS

UNION BONNET — REGRINDING

WITH A GLAND IN STUFFING BOX

FOR STEAM WORKING PRESSURES UP TO 150 POUNDS

TESTED TO 250 POUNDS HYDRAULIC PRESSURE PER SQUARE INCH



No. 71 GLOBE

CODE: AFGANOS

No. 71 ANGLE

CODE: AFHEKSEN

Size	Inches		¾	1	1¼		
Size	Millimeters		19	25	32		
No. 71, Globe or Angle, Flanged	Each		6.00	8.00	11.00		
No. 75, Cross, Flanged	Each		9.25	12.25	17.00		
Diameter of Flanges	Inches		3½	4	4½		
Face to Face, Globe, Flanged	Inches		3 11/16	4 3/16	4 9/16		
Center to Inlet or Outlet, Angle, Flanged	Each		2¼	2½	2 7/8		
Face to Face, Cross, Flanged	Inches		4½	5	5¾		
Size	Inches	1½	2	2½	3	3½	4
Size	Millimeters	38	50	64	76	90	100
No. 71, Globe or Angle, Flanged	Each	14.00	20.00	33.00	48.00	65.00	90.00
No. 75, Cross, Flanged	Each	23.00	33.00	48.00	72.00		
Diameter of Flanges	Inches	5	6	7	7½	8½	9
Face to Face, Globe, Flanged	Inches	5 5/16	6	6¾	7 15/16	8 7/8	9 5/8
Center to Inlet or Outlet, Angle, Flg'd	In.	3 3/16	3¾	4 5/16	4 5/8	5¼	5½
Face to Face, Cross, Flanged	Inches	6 3/8	7½	8 5/8	9¼	10½	11

For description and directions for regrinding, see page 18.
Templates for drilling, page 595. Price List for drilling, page 483.
In ordering, state whether Globe, Angle or Cross Valves are wanted.

CRANE NAVY VALVES

HORIZONTAL AND ANGLE CHECK

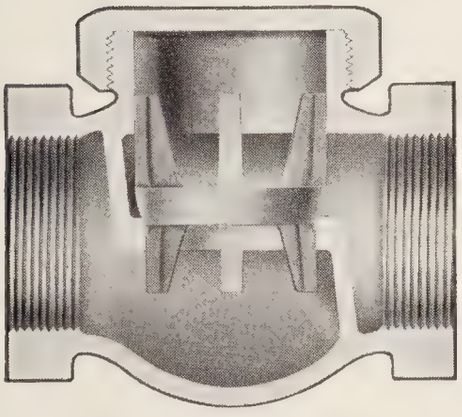
CRANE SPECIAL BRASS

UNION BONNET REGRINDING

FOR STEAM WORKING PRESSURES, AS FOLLOWS:

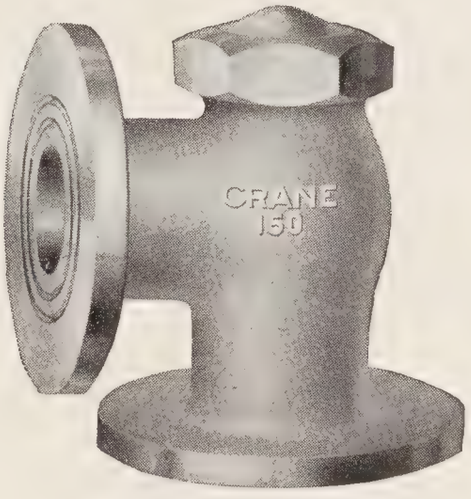
SCREWED { SIZES 1¼-INCH AND SMALLER, UP TO 225 POUNDS
SIZES 1½ TO 3-INCH, INCLUSIVE, UP TO 200 POUNDS
FLANGED, UP TO 150 POUNDS

TESTED TO 250 POUNDS HYDRAULIC PRESSURE PER SQUARE INCH



No. 72. HORIZONTAL SCREWED
CODE: AFMOLMEN

No. 73. HORIZONTAL FLANGED
CODE: AFOLLABAN



No. 73. ANGLE FLANGED
CODE: AFRACAMOS

No. 72. ANGLE SCREWED
CODE: AFOGADILHO

Size.....Inches	¼	⅜	½	¾	1
Size.....Millimeters	6	10	13	19	25
No. 72, Screwed, Horizontal or Angle.....Each	1.15	1.35	1.70	2.25	3.15
No. 73, Flanged, Horizontal or Angle.....Each				5.00	7.00
Diameter of Flanges.....Inches				3½	4
Face to Face, Horizontal, Flanged.....Inches				3 11/16	4 3/16
Center to Inlet or Outlet, Angle, Flanged..Inches				2¼	2½
Size.....Inches	1¼	1½	2	2½	3
Size.....Millimeters	32	38	50	64	76
No. 72, Screwed, Horizontal or Angle.....Each	4.50	6.30	9.90	18.00	26.00
No. 73, Flanged, Horizontal or Angle.....Each	10.00	13.00	18.00	30.00	43.00
Diameter of Flanges.....Inches	4½	5	6	7	7½
Face to Face, Horizontal Flanged.....Inches	4 9/16	5 5/16	6	6¾	7 15/16
Center to Inlet or Outlet, Angle, Flanged..Inches	2⅞	3 3/16	3¾	4 5/16	4 5/8

In ordering, give Valve number and state whether Horizontal or Angle, Flanged or Screwed Valves are wanted.

INSTRUCTIONS FOR REGRINDING

Unscrew the large nut or cap and take out disc; put regrinding compound and a little oil on disc; replace the disc and rotate forward and backward until a tight joint is formed. See that all regrinding compound is removed before again using the Valve in service.

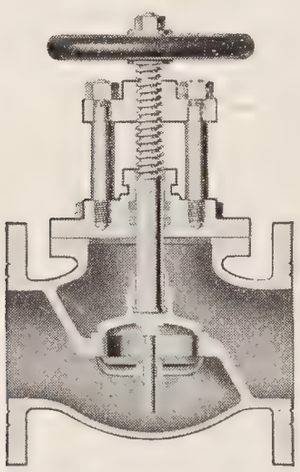
Templates for drilling, page 595. Price List for drilling, page 483.

MEDIUM BOLTED BONNET

GLOBE, ANGLE AND CROSS, STOP AND SCREW-DOWN CHECK VALVES

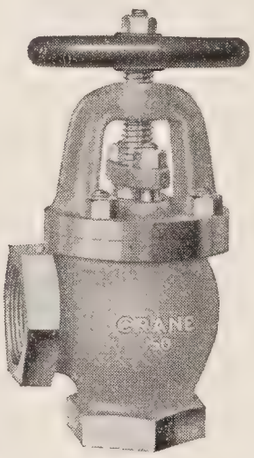
CRANE SPECIAL BRASS **RENEWABLE SEAT**

FOR STEAM WORKING PRESSURES UP TO 150 POUNDS PER SQUARE INCH



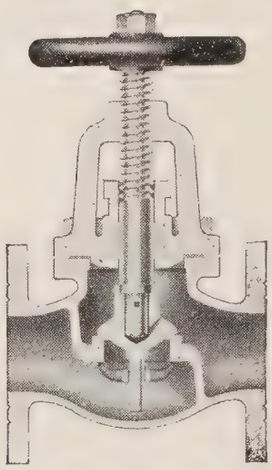
CROSSHEAD TYPE No. 77, FLANGED GLOBE STOP

CODE: AGALIBAR



YOKE TYPE No. 76 SCREWED ANGLE STOP

CODE: AGAGARUM



YOKE TYPE No. 4177, FLANGED GLOBE SCREW-DOWN CHECK

CODE: AGORGOJARE

Sizes 3 inch and smaller are Yoke Type.
Sizes 3½ inch and larger are Crosshead Type.

Size.....Inches	1½	2	2½	3	3½	4	4½	5	6
Size.....Millimeters	38	50	64	76	90	100	113	125	150

STOP VALVES

No. 76 Globe or Angle, Screwed.....Each	19.00	25.00	32.00	42.00					
No. 76 Cross, Screwed.....Each	24.00	31.00	43.00	60.00					
No. 77 Globe or Angle, Flanged.....Each	27.00	35.00	45.00	60.00	110.00	140.00	175.00	215.00	260.00
No. 77 Cross, Flanged.....Each	33.00	42.00	58.00	80.00	135.00	170.00	215.00	260.00	315.00

SCREW-DOWN CHECK VALVE

No. 4176 Globe or Angle, Screwed.....Each	23.00	29.50	37.00	49.00					
No. 4176 Cross, Screwed.....Each	28.00	35.50	48.00	67.00					
No. 4177 Globe or Angle, Flanged.....Each	31.00	39.50	50.00	67.00	118.00	149.00	186.00	229.00	277.00
No. 4177 Cross, Flanged.....Each	37.00	46.50	63.00	87.00	143.00	179.00	226.00	274.00	332.00

DIMENSIONS,

Size.....Inches	1½	2	2½	3	3½	4	4½	5	6
Face to Face, Globe, Flanged.....	5⅞	6⅞	8	9⅛	10⅜	11	11⅝	12¼	14
Center to Face, Angle and Cross, Flanged...	3⅛	3¾	4¼	4⅝	5¼	5½	5⅞	6¼	7
Diameter of Flanges.....	5	6	7	7½	8½	9	9¼	10	11
Thickness of Flanges.....	7/16	½	9/16	⅝	11/16	11/16	23/32	¾	13/16
End to End, Globe, Screwed.....	5 5/16	6	7¼	8¼					
Center to End, Angle and Cross, Screwed...	2 11/16	3	3⅝	4⅛					

These Valves are popular for Marine Service. For complete information on Marine Material see Marine Catalogue No. 4500.

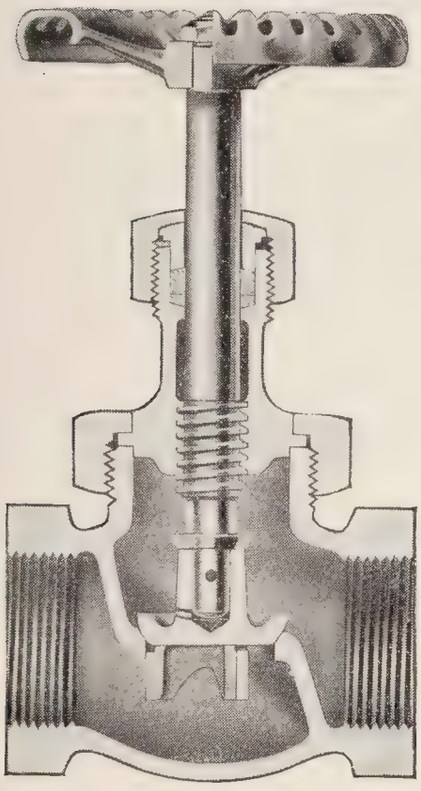
When screw-down Check Valves are required with spring on disc, they will be furnished at a special price.

In ordering state whether Globe, Angle or Cross Valves are wanted.

Templates for drilling, page 535.

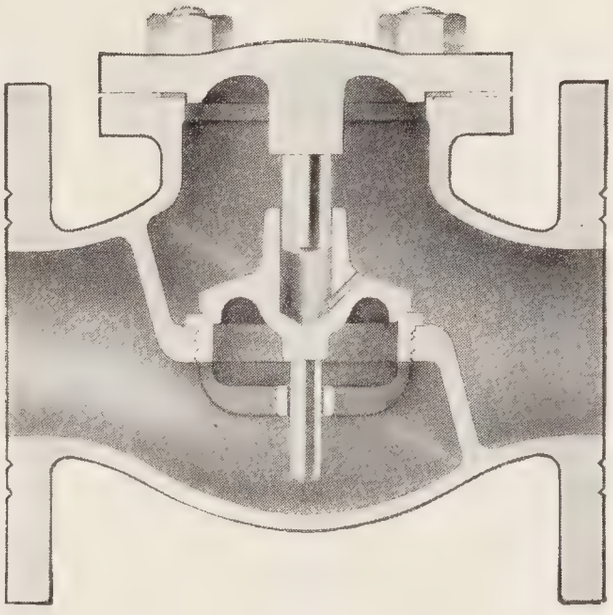
Price List for drilling, page 484.

BRASS VALVES FOR MARINE SERVICE



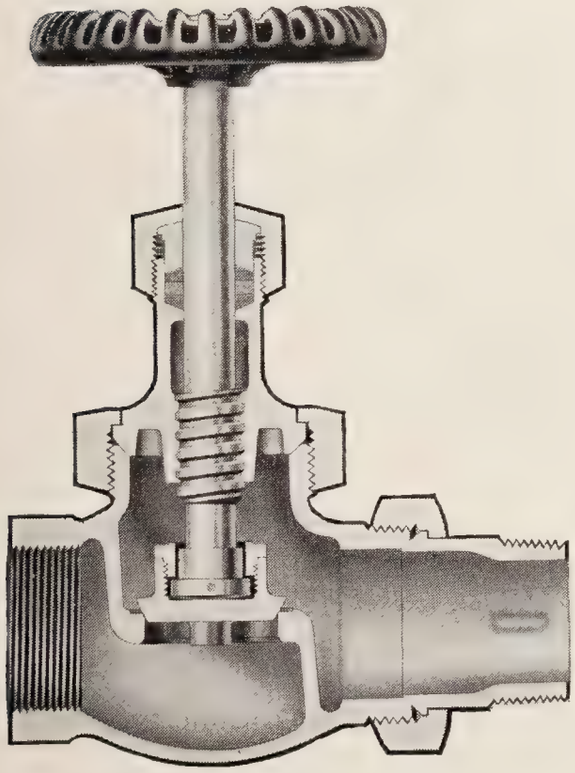
No. 4170. MEDIUM GLOBE SCREW-DOWN CHECK VALVE, SCREWED

CODE: AGUIJADURA



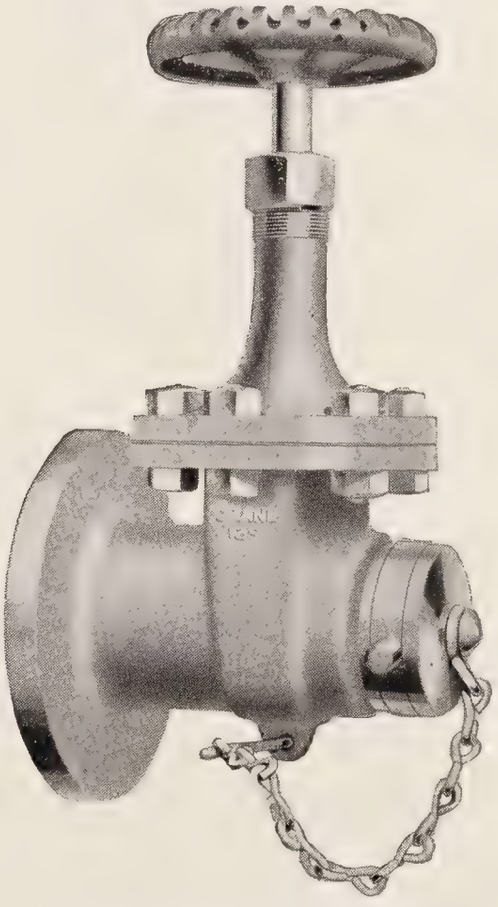
No. 4063. MEDIUM HORIZONTAL LIFT CHECK VALVE, FLANGED

CODE: AGUIJONABA



No. 4270. GLOBE RADIATOR VALVE

CODE: AGUILHANDO



No. 4451. STANDARD HOSE GATE VALVE, FLANGED, WITH CAP AND CHAIN

CODE: AGUILONAR

WE MANUFACTURE A COMPLETE LINE OF VALVES AND FITTINGS FOR MARINE SERVICE

WRITE FOR INFORMATION AND PRICES

MEDIUM

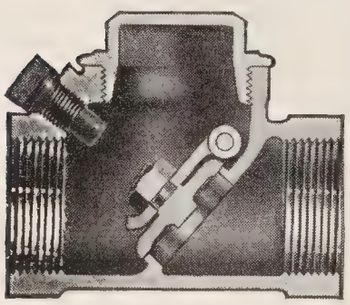
SWING CHECK VALVES

CRANE SPECIAL BRASS

FOR STEAM WORKING PRESSURES, AS FOLLOWS:

NO. 35. SIZES 2-INCH AND SMALLER, 200 POUNDS
NO. 35. SIZES 2½ AND 3 INCH, 150 POUNDS
NO. 35½. UP TO 150 POUNDS
NO. 37. UP TO 150 POUNDS

No. 35 MAY BE USED IN A HORIZONTAL POSITION OR FOR UPWARD FLOW



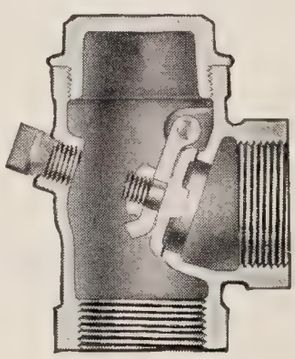
No. 35

CODE: AJIACOLAS

Size.....Inches	¼	⅜	½	¾	1
Size.....Millimeters	6	10	13	19	25
No. 35, Horizontal... Each	2.50	2.50	2.75	3.10	4.00
Size.....Inches	1¼	1½	2	2½	3
Size.....Millimeters	32	38	50	64	76
No. 35, Horizontal...Each	5.50	7.00	10.00	19.00	27.00

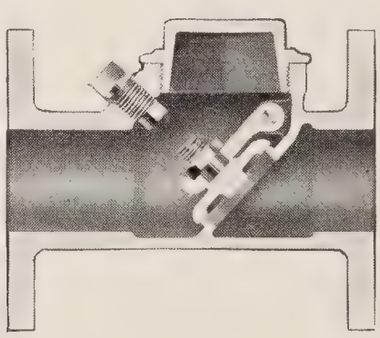
Size.....Inches	½	¾	1	1¼
Size.....Millimeters	13	19	25	32
No. 37, Angle.....Each	2.75	3.10	4.00	5.50
Size.....Inches	1½	2	2½	3
Size.....Millimeters	38	50	64	76
No. 37, Angle.....Each	7.00	10.00	19.00	27.00

Flanged Angle Swing Check Valves made to order at a special price.



NO. 37 ANGLE

CODE: AJUAGAS



NO. 35½

CODE: ALABAVAM

MAY BE USED IN A HORIZONTAL POSITION OR FOR UPWARD FLOW

Size.....Inches	¾	1	1¼	1½	2	2½	3
Size.....Millimeters	19	25	32	38	50	64	76
No. 35½, Horizontal.....Each	10.00	12.50	17.00	21.00	35.00	50.00	65.00
Face to Face.....Inches	4¾	5	5⅝	6⅛	7⅜	8½	9⅛
Diameter of Flanges.....Inches	3½	4	4½	5	6	7	7½

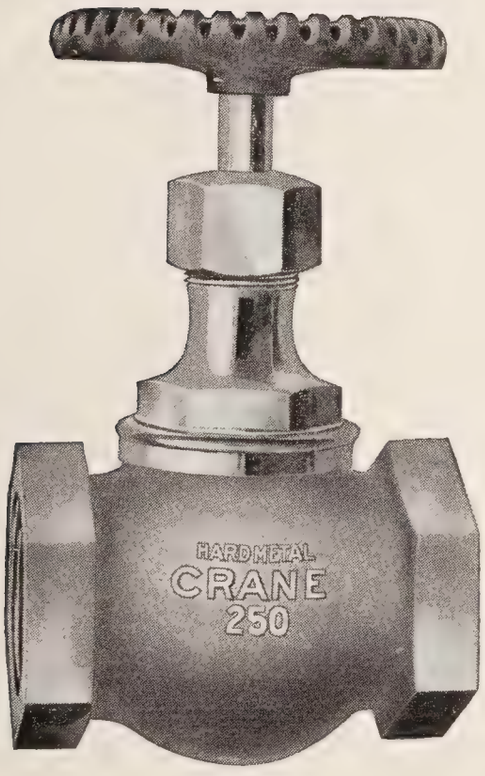
Templates for drilling, page 595. Price List for drilling, page 484.

EXTRA HEAVY

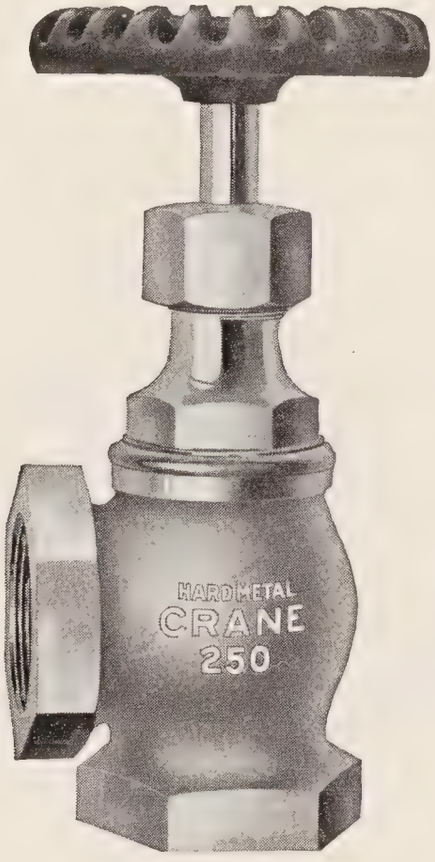
GLOBE AND ANGLE VALVES

CRANE HARD METAL (BRONZE)

FOR SATURATED STEAM WORKING PRESSURES UP TO 250 POUNDS
FOR SUPERHEATED STEAM WORKING PRESSURES UP TO 250 POUNDS
AND A TOTAL TEMPERATURE OF 500 DEGREES FAHR.



No. 4. GLOBE
CODE: ALAMBUCHA



No. 4. ANGLE
CODE: ALANABALE

Size.....Inches	1/8	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3
Size.....Millimeters	3	6	10	13	19	25	32	38	50	64	76
Price.....Each	1.30	1.30	1.50	1.90	2.50	3.50	5.00	7.00	11.00	20.00	29.00

These valves have the body and disc made of Crane "Hard Metal" which is almost as hard as Steel and they have successfully resisted the cutting effects of steam and water. The trimmings are made of "Crane Special Brass." The merits of these metals are further described on page 2.

These valves have withstood hard tests on extreme pressures and severe service and are particularly recommended where strong and durable Valves are desired.

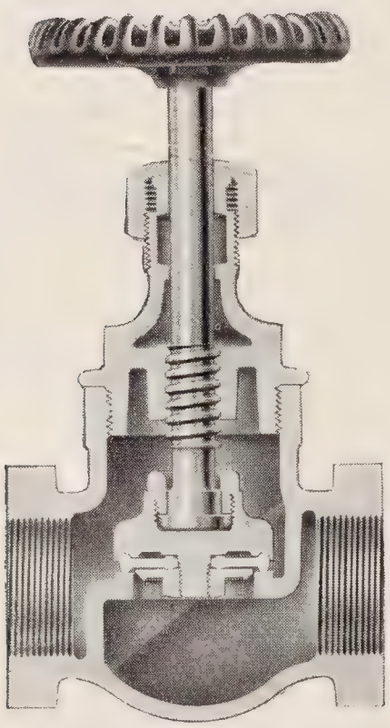
These valves, when wide open, may be repacked while under pressure.

Sizes 3/4 inch and larger have a gland in the stuffing box.

In ordering, specify whether Globe or Angle Valves are wanted.

EXTRA HEAVY
COPPER DISC
GLOBE AND ANGLE VALVES
CRANE SPECIAL BRASS

NON-HEATING WHEEL WITH A GLAND IN THE STUFFING BOX
FOR SATURATED STEAM WORKING PRESSURES UP TO 250 POUNDS
TESTED TO 800 POUNDS HYDRAULIC PRESSURE



No. 60 E GLOBE
CODE: ALARDEADAS

No. 60 E ANGLE
CODE: ALARMARMOS

GLOBE OR ANGLE

Size.....Inches	¼	⅜	½	¾	1	1¼	1½	2	2½	3
Size.....Millimeters	6	10	13	19	25	32	38	50	64	76
No.60E, Screwed. Each	3.25	3.25	3.75	4.25	5.50	7.75	10.00	15.00	27.50	38.50
No. 61 E, Flanged.....Each					11.00	15.00	21.00	28.00	45.00	68.00
Diameter of Flanges. Inches					4½	5	6	6½	7½	8¼
Face to Face, Globe, Flg'd In.					4 1/16	4½	5 3/16	6 3/16	7 7/16	8 7/8
Center to Face, Ang., Flg'd In.					2 15/16	3 3/16	3¾	4 1/16	4 11/16	5½

EXTRA COPPER DISCS

Size.....Inches	¼	⅜	½	¾	1	1¼	1½	2	2½	3
Size.....Millimeters	6	10	13	19	25	32	38	50	64	76
Price.....Each	.08	.08	.08	.10	.12	.18	.24	.36	.48	.80

The Crane Copper Disc has successfully overcome the many objections found in some types of hard rubber or composition discs.

The construction of the disc and holder is such that the disc may be easily taken out and replaced.

When so ordered these Valves are supplied with a brass disc having a ground seat.

These Valves when wide open may be repacked while under pressure.

These Valves can be furnished with Hard Metal Body and Disc as illustrated on page 35.

In ordering, state whether Globe or Angle Valves are wanted.

An extra price is charged for Drilling Flanged Valves.

Templates for drilling, page 595. Price List for drilling, page 484.

EXTRA HEAVY

SWING CHECK VALVES

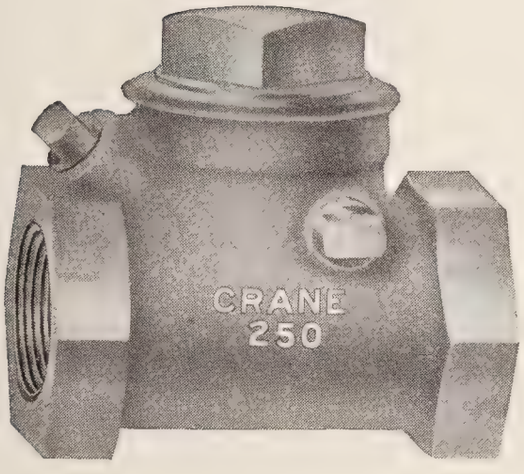
CRANE SPECIAL BRASS

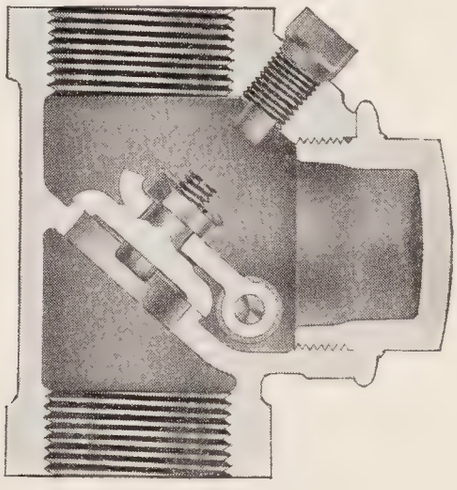
RECOMMENDED FOR

250 POUNDS SATURATED STEAM

250 POUNDS SUPERHEATED STEAM WITH TOTAL TEMPERATURE OF 500 DEGREES FAHR.

TESTED TO 800 POUNDS HYDRAULIC PRESSURE





NO. 74 E
CODE: ALEGRASTE

APPLIED HORIZONTALLY

APPLIED FOR UPWARD FLOW

Size.....Inches	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2
Size.....Millimeters	10	13	19	25	32	38	50	64
No. 74 E. Screwed.....Each	2.70	2.70	3.25	4.25	6.00	7.50	12.00	25.00
No. 75 E. Flanged.....Each				13.00	18.00	22.00	37.50	55.00
Diameter of Flanges.....Inches				4 1/2	5	6	6 1/2	7 1/2

THESE VALVES ARE MADE OF "CRANE SPECIAL BRASS," THE MERITS OF WHICH ARE FULLY DESCRIBED ON PAGE 2

Templates for drilling, page 595. Price List for drilling, page 484.

EXTRA HEAVY

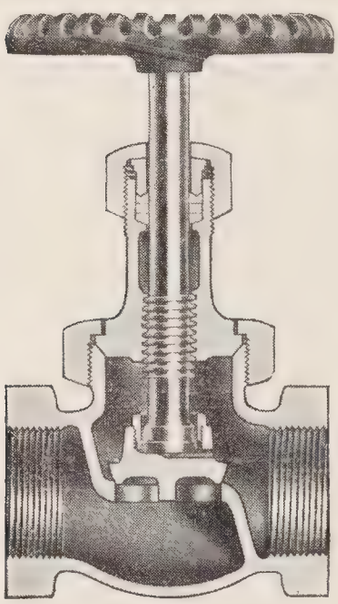
GLOBE, ANGLE AND CROSS VALVES

CRANE SPECIAL BRASS

UNION BONNET — REGRINDING

WITH A GLAND IN THE STUFFING BOX

FOR SATURATED STEAM WORKING PRESSURES UP TO 250 POUNDS
FOR SUPERHEATED STEAM WORKING PRESSURES UP TO 250 POUNDS
AND A TOTAL TEMPERATURE OF 500 DEGREES FAHR.



No. 82 E GLOBE

CODE: ALMADENETA

IN ORDERING STATE WHETHER GLOBE, ANGLE OR CROSS VALVES ARE WANTED

No. 82 E ANGLE

CODE: ALMAMUN

Size....Inches	1/4	3/8	1/2	3/4	1
Size....Millimeters	6	10	13	19	25
No. 82 E, Globe or Angle, Screwed....Each	1.30	1.50	1.90	2.50	3.50
No. 83 E, Globe or Angle, Flanged....Each				6.00	8.00
No. 90 E, Cross, Screwed....Each			2.65	3.50	4.75
No. 91 E, Cross, Flanged....Each				9.25	12.25
Diameter of Flanges....Inches				4	4 1/2
Face to Face, Globe, Flanged....Inches				3 3/4	4 3/8
Center to Inlet or Outlet, Angle, Flanged....Inches				2 9/16	2 7/8
Face to Face, Cross, Flanged....Inches				5 1/8	5 3/4
Size....Inches	1 1/4	1 1/2	2	2 1/2	3
Size....Millimeters	32	38	50	64	76
No. 82 E, Globe or Angle, Screwed....Each	5.00	7.00	11.00	20.00	29.00
No. 83 E, Globe or Angle, Flanged....Each	11.00	14.00	20.00	33.00	48.00
No. 90 E, Cross, Screwed....Each	6.00	9.00	14.00	28.00	42.00
No. 91 E, Cross, Flanged....Each	17.00	23.00	33.00	48.00	72.00
Diameter of Flanges....Inches	5	6	6 1/2	7 1/2	8 1/4
Face to Face, Globe, Flanged....Inches	4 13/16	5 1/2	6 1/2	7 5/8	8 3/8
Center to Inlet or Outlet, Angle, Flanged....Inches	3 1/8	3 3/4	4 1/16	4 9/16	5 1/16
Face to Face, Cross, Flanged....Inches	6 1/4	7 1/8	8 1/8	9 1/8	10 1/8

For description of this type of valve, and directions for regrinding, see page 18.
For larger sizes, see No. 85 E and No. 87 E, page 30.
Templates for drilling, page 595. Price List for drilling page 484.

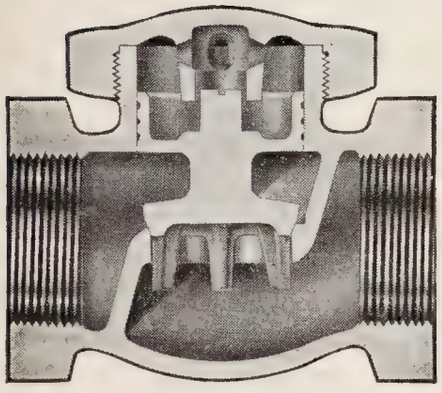
EXTRA HEAVY

HORIZONTAL CHECK VALVES

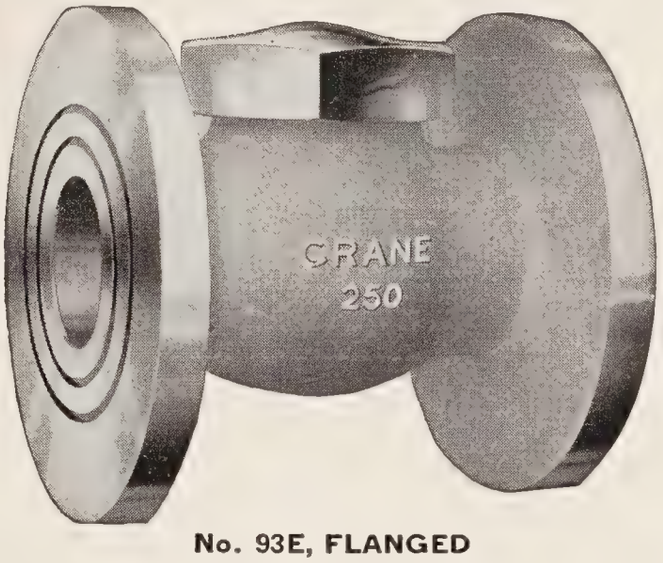
CRANE SPECIAL BRASS

UNION BONNET REGRINDING

FOR SATURATED STEAM WORKING PRESSURES UP TO 250 POUNDS
FOR SUPERHEATED STEAM WORKING PRESSURES UP TO 250 POUNDS
AND A TOTAL TEMPERATURE OF 500 DEGREES FAHR.



No. 92E, SCREWED
CODE: ALPVATER



No. 93E, FLANGED
CODE: ALQUORQUES

Size	Inches	1/4	3/8	1/2	3/4	1
Size	Millimeters	6	10	13	19	25
No. 92 E, Screwed	Each	1.15	1.35	1.70	2.25	3.15
No. 93 E, Flanged	Each				5.00	7.00
Diameter of Flanges	Inches				4	4 1/2
Face to Face, Flanged	Inches				3 3/4	4 3/8
Size	Inches	1 1/4	1 1/2	2	2 1/2	3
Size	Millimeters	32	38	50	64	76
No. 92 E, Screwed	Each	4.50	6.30	9.90	18.00	26.00
No. 93 E, Flanged	Each	10.00	13.00	18.00	30.00	43.00
Diameter of Flanges	Inches	5	6	6 1/2	7 1/2	8 1/4
Face to Face, Flanged	Inches	4 13/16	5 1/2	6 1/2	7 5/8	8 3/8

INSTRUCTIONS FOR REGRINDING

Unscrew the large nut or cap and take out disc; put grinding compound and a little oil on disc; replace the disc and rotate forward and backward until a tight joint is formed. See that all grinding compound is removed before again using the valve in service.

Templates for drilling, page 595. Price List for drilling, page 484.

EXTRA HEAVY GLOBE, ANGLE AND CROSS, STOP AND SCREW-DOWN CHECK VALVES

BOLTED BONNET — RENEWABLE SEAT

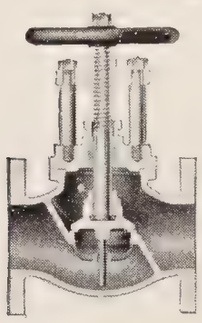
CRANE SPECIAL BRASS BODIES AND BONNETS

HARD METAL (BRONZE) SEATS AND DISCS

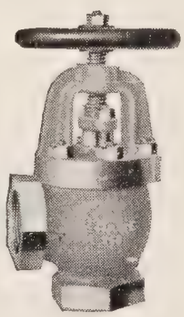
FOR SATURATED STEAM WORKING PRESSURES UP TO 250 POUNDS

FOR SUPERHEATED STEAM WORKING PRESSURES UP TO 250 POUNDS AND A TOTAL TEMPERATURE NOT EXCEEDING 500° FAHRENHEIT

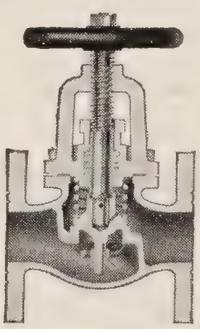
TESTED TO 800 POUNDS PRESSURE WITH VALVE OPEN AND 450 POUNDS AGAINST THE DISC



No. 87E
CROSSHEAD STOP
GLOBE STOP
CODE: ALUMEARTH



No. 85Ξ
SCREWED ANGLE STOP VALVE
CODE: ALUGADORES



No. 4187Ξ
YOKE TYPE
GLOBE SCREW-DOWN CHECK
CODE: AMASHIAH

Sizes 3½ inch and larger are furnished Crosshead Type.
Smaller sizes are furnished Yoke Type.

Size.....Inches	1½	2	2½	3	3½	4	4½	5	6
Size.....Millimeters	38	50	64	76	90	100	113	125	150

STOP VALVES

No. 85-E Globe or Angle, Screwed Each	23.00	30.00	40.00	58.00	.....	.....	.....	.....	.....
No. 85-E Cross, Screwed.....Each	30.00	40.00	.....	.....	.....	.....	.....	.....	.....
No. 87-E Globe or Angle, Flanged..Each	36.00	46.00	60.00	88.00	135.00	170.00	210.00	255.00	320.00
No. 87-E Cross, Flanged.....Each	45.00	58.00	80.00	115.00	165.00	205.00	255.00	305.00	380.00

SCREW-DOWN CHECK VALVES

No. 4186-E Globe or Angle, ScrewedEach	27.00	34.50	.....	.....	.....	.....	.....	.....	.....
No. 4186-E Cross, Screwed.....Each	34.00	44.50	.....	.....	.....	.....	.....	.....	.....
No. 4187-E Globe or Angle, Flanged..Each	42.00	52.50	67.00	97.00	143.00	179.00	221.00	269.00	337.00
No. 4187-E Cross, Flanged.....Each	51.00	64.50	87.00	124.00	173.00	214.00	266.00	319.00	397 00

DIMENSIONS

Size.....Inches	1½	2	2½	3	3½	4	4½	5	6
Face to Face, Globe, Flanged	6⅜	7⅜	8¾	10	10⅞	11½	12¼	13	15
Center to Face, Angle and Cross, Flanged	3¾	4⅛	4⅝	5¼	5¾	6⅛	6⅜	6¾	7¾
Diameter of Flanges	6	6½	7½	8¼	9	10	10½	11	12½
Thickness of Flanges	9/16	5/8	11/16	3/4	13/16	7/8	7/8	15/16	1
End to End, Globe, Screwed	5½	6¼	....	....	....	....	....	....	....
Center to End, Angle and Cross, Screwed	2¾	3⅛	....	....	....	....	....	....	....

Sizes 1½, 2 and 2½ inch, No. 4187E, Flanged, Screw-Down Check Valves are made with a spring on the disc. Other sizes will be furnished with spring on the disc when so ordered, at a special price. In ordering state whether Globe, Angle or Cross Valves are wanted. Templates for drilling, page 595.

Price list for drilling, page 484.

EXTRA HEAVY BOLTED BONNET

HORIZONTAL AND ANGLE CHECK VALVES

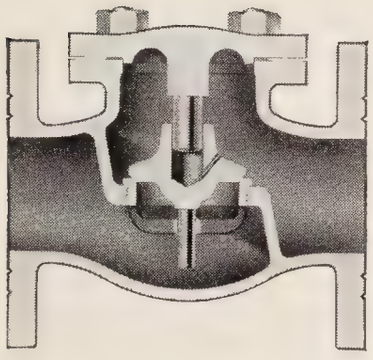
CRANE SPECIAL BRASS BODY AND BONNET

HARD METAL (BRONZE) RENEWABLE SEAT AND DISC

FOR SATURATED STEAM WORKING PRESSURES UP TO 250 POUNDS

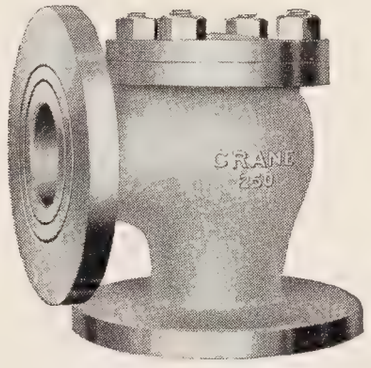
FOR SUPERHEATED STEAM WORKING PRESSURES UP TO 250 POUNDS AND A TOTAL TEMPERATURE OF 500 DEGREES FAHR.

TESTED TO 800 POUNDS HYDRAULIC PRESSURE



No. 4065 E HORIZONTAL

CODE: AMTSVOGT



No. 4065 E ANGLE

CODE: AMUGRONA

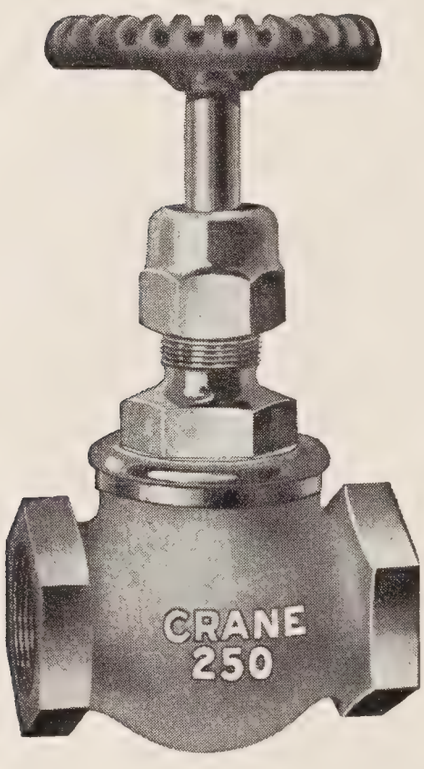
Size.....Inches	1½	2	2½	3	3½	4	4½	5	6
Size.....Millimeters	38	50	64	76	90	100	113	125	150
No. 4064-E, Horiz. or Angle, Screw. Each	19.00	26.00							
No. 4065-E, Horiz. or Angle, Flanged Each	32.00	42.00	55.00	83.00					
Face to Face, Horiz. Flanged . . . Each	6⅜	7⅜	8¾	10	10⅞	11½	12¼	13	15
Center to Face, Angle, Flanged . Each	3¾	4⅛	4⅝	5¼	5¾	6⅛	6⅜	6¾	7¾
Diameter of Flanges.....Each	6	6½	7½	8¼	9	10	10½	11	12½
Thickness of Flanges.....Each	9/16	5/8	11/16	3/4	13/16	7/8	7/8	15/16	1
End to End, Horizontal, Screwed . . Each	5½	6¼							
Center to End, Angle, Screwed. . Each	2¾	3⅛							

No. 4065E—Flanged, 3½ to 6 inch. Prices on application.
In ordering state whether horizontal or angle valves are wanted.
Templates for drilling, page 595. Price list for drilling, page 484.

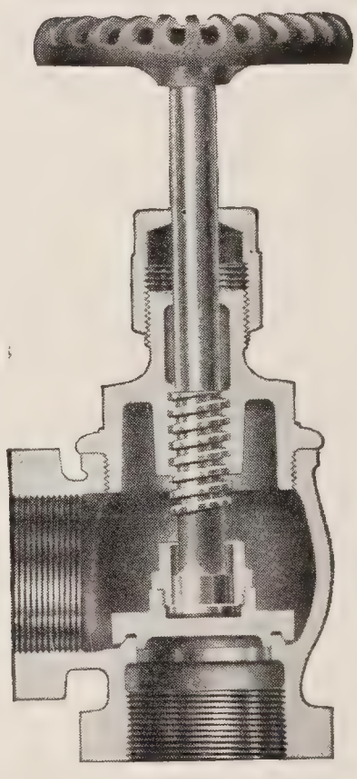
EXTRA HEAVY
GLOBE AND ANGLE VALVES
CRANE HARD METAL (BRONZE)

FOR SATURATED STEAM WORKING PRESSURES UP TO 250 POUNDS

FOR SUPERHEATED STEAM WORKING PRESSURES UP TO 250 POUNDS AND A TOTAL TEMPERATURE NOT EXCEEDING 500 DEGREES FAHR.



No. 392½ GLOBE
CODE: ANABROSIS



No. 392 ANGLE
CODE: ANABASARTA

Size.....Inches	¾	1	1¼	1½	2
Size.....Millimeters	19	25	32	38	50
Price, Globe or Angle.....Each	2.50	3.50	5.00	7.00	10.00

Unless otherwise ordered, the Angle Pattern will be furnished.

DESCRIPTION

These Valves have the body and disc made of Crane Hard Metal which is almost as hard as steel and they have successfully resisted the cutting effects of steam and water.

The trimmings are made of "Crane Special Brass." The merits of these metals are described on page 2.

These Valves are for use as Blow-Offs on boilers, skimming lines and for all other purposes where it is desirable to blow off dirty water, or water containing grit or sediment under pressure.

WE CALL PARTICULAR ATTENTION TO THE CONSTRUCTION OF THE DISC AND SEAT IN THESE VALVES, FOR IT IS THE PECULIAR CONSTRUCTION OF THESE PARTS WHICH GIVE MERIT TO THIS VALVE FOR THE SERVICES OUTLINED ABOVE. THE POSSIBILITY OF SCALE AND DIRT LODGING ON THIS TYPE OF SEAT AND DISC IS MINIMIZED.

EXTRA HEAVY

GLOBE AND ANGLE VALVES

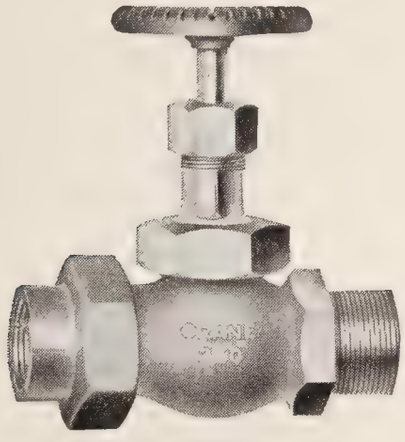
DESIGNED FOR USE ON

LOCOMOTIVES

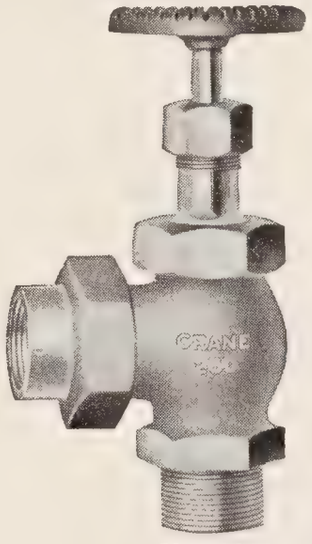
CRANE SPECIAL BRASS

UNION BONNET WITH A GLAND IN STUFFING BOX REGRINDING

FOR SATURATED STEAM WORKING PRESSURES UP TO 250 POUNDS
FOR SUPERHEATED STEAM WORKING PRESSURES UP TO 250 POUNDS AND A TOTAL TEMPERATURE NOT EXCEEDING 500 DEGREES FAHRENHEIT



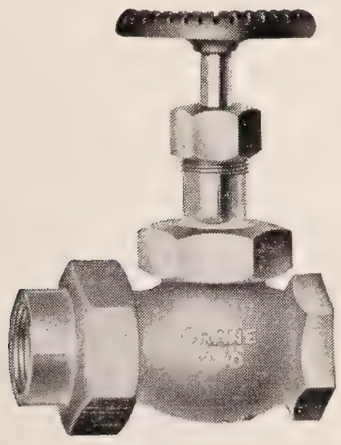
No. 1803
MALE INLET, FEMALE UNION OUTLET, WITH MALLEABLE NUT
CODE: ANAFALLA



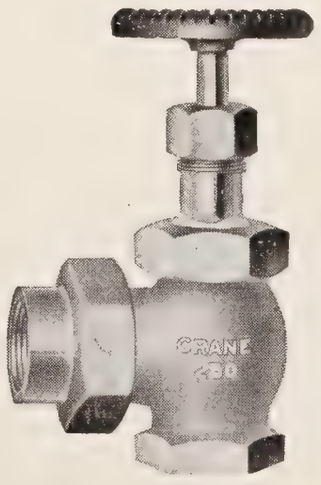
No. 1811
MALE INLET, FEMALE UNION OUTLET, WITH MALLEABLE NUT
CODE: ANAKAMP

Size..... Inches	3/8×1/4	1/2×3/8	3/4×1/2	1×3/4	1 1/4×1	1 1/2×1 1/4	2×1 1/2	2 1/2×2	2 1/2×3
Size.....Millimeters	10×6	13×10	19×13	25×19	32×25	38×32	50×38	64×50	64×76
Nos. 1803 and 1811, Each	2.40	2.60	3.60	4.90	7.35	9.50	13.00	20.50	38.00

The Male inlet end is one pipe size larger than the Female union outlet end. The size of the Valve is governed by the size of the union outlet.



No. 1805
FEMALE INLET, FEMALE UNION OUTLET, WITH MALLEABLE NUT
CODE: ANCLIFF



No. 1813
FEMALE INLET, FEMALE UNION OUTLET, WITH MALLEABLE NUT
CODE: ANCULANDOS

Size.....Inches	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2
Size.....Millimeters	6	10	13	19	25	32	38	50
Nos. 1805 and 1813.....Each	2.25	2.25	3.00	4.00	5.75	7.75	10.50	17.00

EXTRA HEAVY

GLOBE VALVES

DESIGNED FOR USE ON

LOCOMOTIVES

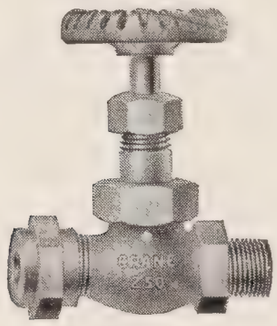
CRANE SPECIAL BRASS

UNION BONNET WITH A GLAND IN STUFFING BOX REGRINDING

FOR SATURATED STEAM WORKING PRESSURES UP TO 250 POUNDS

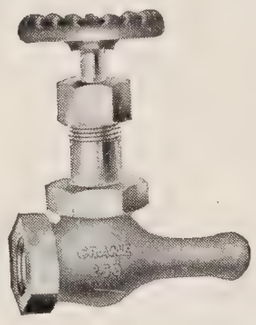
FOR SUPERHEATED STEAM WORKING PRESSURES UP TO 250 POUNDS AND A TOTAL TEMPERATURE NOT EXCEEDING 500 DEGREES FAHRENHEIT

FROST VALVE

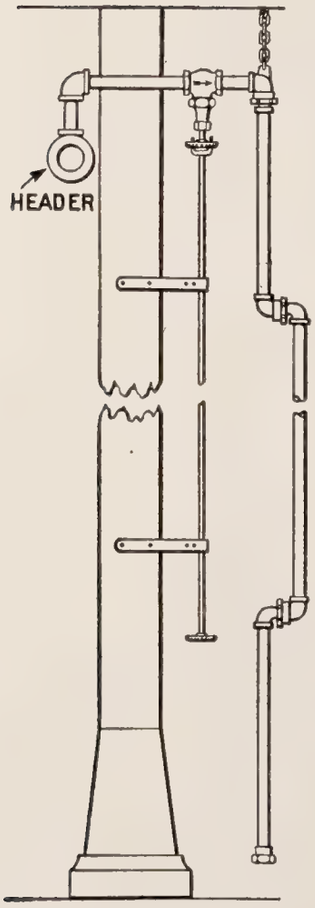


No. 1800
⅜ INCH ONLY
CODE: ANEJARIA

CAB HOSE VALVE



No. 1801—GLOBE
FEMALE INLET, HOSE END OUTLET
CODE: ANEJOME



METHOD OF INSTALLING ROUND HOUSE BLOWER VALVE

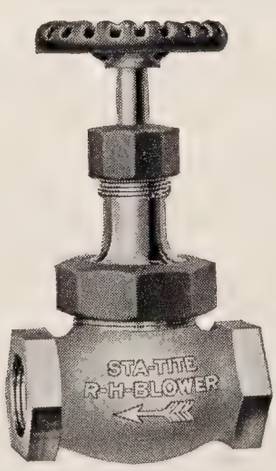
Size, Inlet.....Inches	⅜	½	½
Size, Inlet.....Millimeters	10	13	13
Size of Hose.....Inches	½	¾	½
Price, No. 1801.....	2.35	2.75	2.75
Price, No. 1800.....	2.00		

CRANE STA-TITE ROUND HOUSE BLOWER VALVE

CRANE RENEWABLE DISC

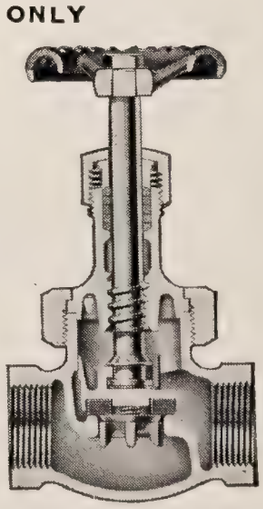
FOR 150 POUNDS WORKING PRESSURE

TO BE USED IN THIS SERVICE ONLY



No. 84

CODE: ANELITIAMO



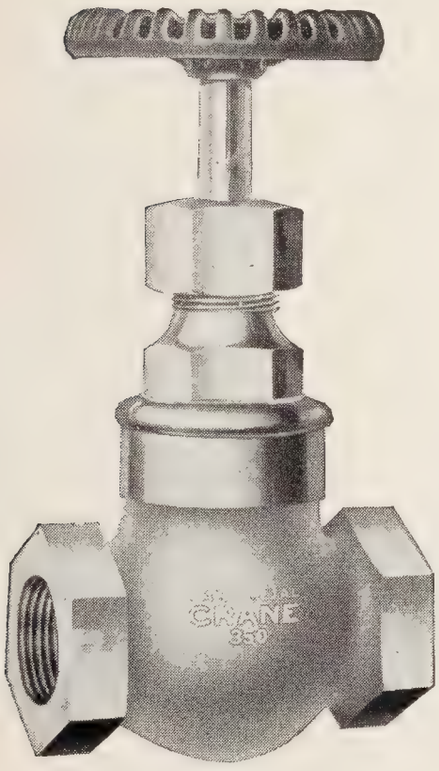
Size.....Inches	1
Size.....Millimeters	25
Price.....Each	5.50

EXTRA HEAVY

GLOBE, ANGLE AND CHECK VALVES

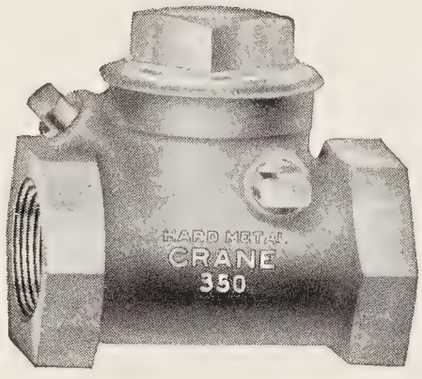
CRANE HARD METAL (BRONZE)

FOR SATURATED STEAM WORKING PRESSURES UP TO 350 POUNDS
FOR SUPERHEATED STEAM WORKING PRESSURES UP TO 250 POUNDS
AND A TOTAL TEMPERATURE NOT EXCEEDING 700° FAHR.
FOR COLD WATER WORKING PRESSURES UP TO 500 POUNDS
TESTED TO 800 POUNDS HYDRAULIC PRESSURE



No. 228 H GLOBE

CODE: ANFANASTE



No. 78 E

CODE: ANFIDROMIA

MAY BE USED IN A HORIZONTAL LINE OR FOR UPWARD FLOW

In ordering, state whether Globe or Angle Valves are wanted.

Size.....Inches	½	¾	1	1¼	1½	2
Size.....Millimeters	13	19	25	32	38	50
No. 228 H, Globe or Angle.....Each	3.75	4.25	5.50	7.75	10.00	15.00
No. 78 E, Check.....Each	4.25	5.00	6.50	8.50	11.50	17.50

The 228 H Valve, when wide open, may be repacked while under pressure. No. 228 H Valves have a gland in the stuffing box.

WORKING PRESSURES

These Valves are suitable for the working pressures specified above when used in hydraulic installations in which shock is absent or so slight as to be negligible. WHEN SUBJECT TO SHOCK they are NOT recommended for these pressures. See explanatory notes on page 175.

AIR OR GAS

Valves for Air or Gas are SPECIAL. See explanatory notes on page 175.

The body and disc of these Valves are made of "Hard metal." All other parts (except wheel) are made of "Crane Special Brass." The merits of these metals are fully described on page 2.

HIGH PRESSURE
GLOBE AND ANGLE VALVES
AND
HORIZONTAL AND ANGLE CHECK VALVES

HARD METAL (BRONZE)

WITH A PACKING GLAND IN THE STUFFING BOX

BODY AND BONNET, HARD METAL (BRONZE). ROLLED MONEL STEM
MALLEABLE IRON HANDLE, STUFFING NUT AND UNION BONNET RING
NICALLOY RENEWABLE DISC AND SEAT

SATURATED STEAM PRESSURES UP TO 350 POUNDS
SUPERHEATED STEAM PRESSURES UP TO 300 POUNDS
SUPERHEATED STEAM TEMPERATURES UP TO 700°F

No. 62 E
GLOBE
CODE: ANGEBINDES

No. 64 E
HORIZONTAL CHECK
CODE: ANGEHORDE

Size.....Inches	½	¾	1	1¼	1½	2
Size.....Millimeters	13	19	25	32	38	50
No. 62 E Globe or Angle.....Each	10.50	12.50	16.00	21.00	28.00	37.00
No. 64 E Horizontal or Angle check...Each	7.50	9.75	12.00	16.00	20.00	27.00

These Valves are designed to be used for Superheated Steam lines and for other severe services where discs and seats must withstand severe wear and be replaced easily with little interruption to the service.

We know from experience that lever handles, stuffing nuts and union bonnet rings often receive rough treatment, and therefore, have made these parts of malleable iron which is stronger, tougher and stiffer than any brass.

The disc slips onto the stem, is accurately guided in the body, whether the Valve is open, partly open or closed, and may be slipped off the stem easily when it is removed from the body.

The throttling lip and the special inside guide for the disc are features which are a distinct advantage.

Besides the quick change features and the malleable iron parts, the Globe and Angle Valves have glands in the stuffing boxes, and the stems have shoulders which make tight seats against the bonnets, permitting the valves to be repacked, when wide open, under pressure.

UNION BONNET HYDRAULIC

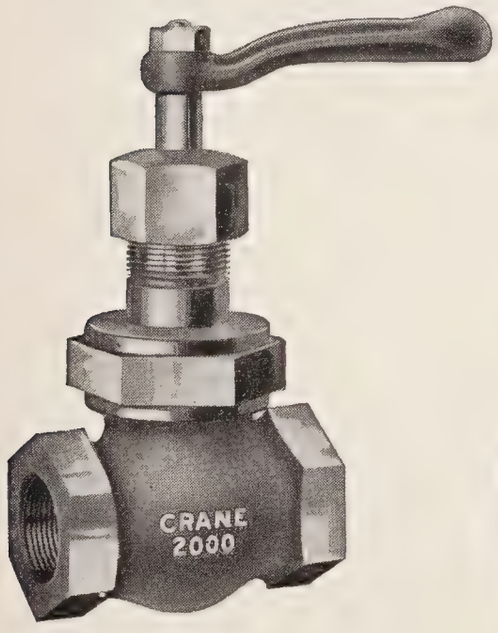
GLOBE, ANGLE AND CHECK VALVES

CRANE HARD METAL (BRONZE)

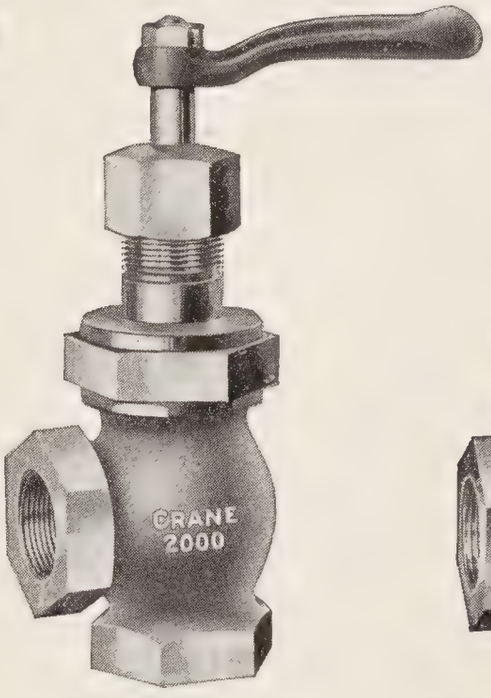
FOR COLD WATER OR OIL WORKING PRESSURES:

SIZES 1 INCH AND SMALLER, UP TO 2000 POUNDS HYDROSTATIC
SIZE 1¼ INCH, UP TO 1500 POUNDS HYDROSTATIC

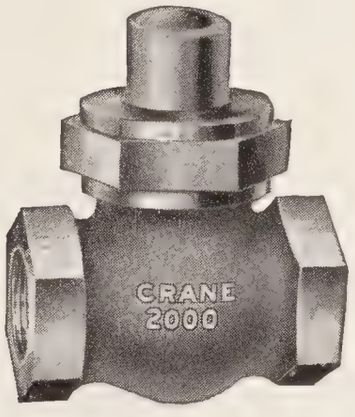
TESTED TO HYDROSTATIC PRESSURES CORRESPONDING TO THE ABOVE WORKING PRESSURES WITH VALVE OPEN AND CLOSED



No. 232 H GLOBE
WITH GLAND
CODE: ANHABIGEN



No. 232 H ANGLE
WITH GLAND
CODE: ANILHACAR



No. 234 H
HORIZONTAL CHECK
CODE: ANJOVINOS

Size.....Inches	⅜	½	¾	1	1¼
Size.....Millimeters	10	13	19	25	32
Price, Globe or Angle.....Each	6.00	6.00	7.00	9.00	13.00
Price, Horizontal Check.....Each	5.00	5.00	6.00	8.00	11.00

WORKING PRESSURES

These Valves are suitable for the working pressures specified above when used in hydraulic installations in which shock is absent or so slight as to be negligible. WHEN SUBJECT TO SHOCK they are NOT recommended for these pressures. See explanatory notes on page 175.

AIR OR GAS

Valves for Air or Gas are SPECIAL. See explanatory notes on page 175.

THE BODIES AND DISCS OF THESE VALVES ARE MADE OF CRANE "HARD METAL"

The diameter of the seat opening of these Valves is approximately the same as the inside diameter of Double Extra Strong Pipe.

The Globe and Angle Valves, when wide open, may be repacked while under pressure.

When larger sizes are wanted we recommend Valves shown on page 38.

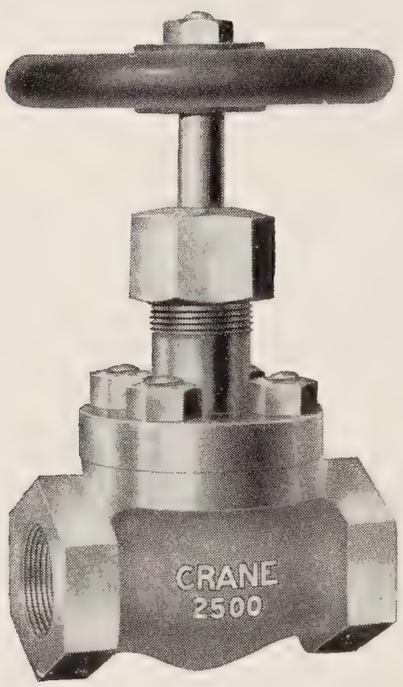
BOLTED BONNET HYDRAULIC

GLOBE AND CHECK VALVES

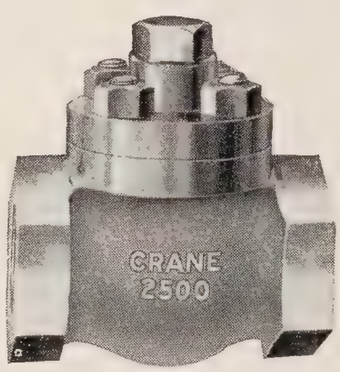
CRANE HARD METAL (BRONZE)

FOR COLD WATER OR OIL WORKING PRESSURES UP TO 2500 POUNDS

TESTED TO 2500 POUNDS HYDROSTATIC PRESSURE WITH VALVE OPEN AND CLOSED



No. 236 H
WITH GLAND
CODE: ANODINABA



No. 238 H
HORIZONTAL
CODE: ANOMOCARPE

Size.....Inches	1	1¼	1½	2	2½
Size.....Millimeters	25	32	38	50	64
Price, Globe.....Each	22.50	27.50	35.00	47.50	90.00
Price, Check.....Each	18.00	22.50	27.50	40.00	

THE BODIES AND DISCS OF THESE VALVES ARE MADE OF "HARD METAL"

The diameter of the seat opening of these Valves is approximately the same as the inside diameter of Double Extra Strong Pipe.

These Valves when wide open may be repacked while under pressure.

The 236 H Valves have a gland in the Stuffing Box.

WORKING PRESSURES

These Valves are suitable for the working pressures specified above when used in hydraulic installations in which shock is absent or so slight as to be negligible. WHEN SUBJECT TO SHOCK they are NOT recommended for these pressures. See explanatory notes on page 175.

AIR OR GAS

Valves for Air or Gas are SPECIAL. See explanatory notes on page 175.

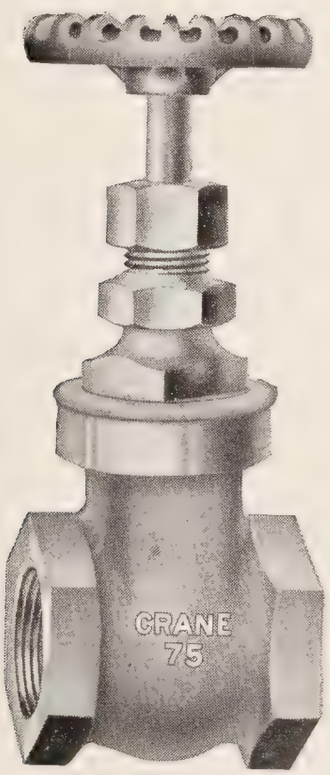
LOW PRESSURE

WEDGE GATE VALVES

BRASS

NON-RISING STEM

FOR STEAM WORKING PRESSURE UP TO 75 POUNDS



No. 449½ SCREWED

CODE: ANQUIRUNT

Size.....Inches	½	¾	1	1¼	1½	2
Size.....Millimeters	13	19	25	32	38	50
Price, No. 449½.....Each	1.65	2.05	2.80	3.70	5.00	7.30

There is a demand for a wedge gate valve with non-rising stem, somewhat lighter than our No. 438 Non-rising stem gate valve suitable for installations where the pressure does not exceed 100 pounds on cold water or 75 pounds on steam or hot water.

These valves are designed to meet the above requirements and are lighter than our line of Standard valves. They are correctly proportioned and pleasing in appearance.

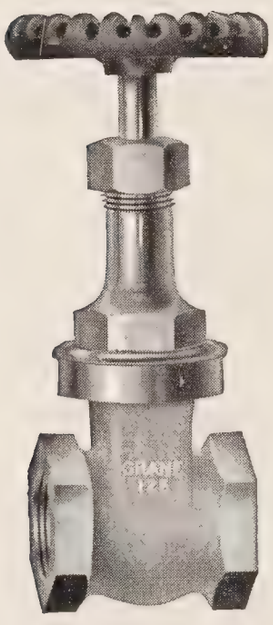
STANDARD

DOUBLE DISC GATE VALVES

BRASS

PARALLEL SEATS **RISING STEM**

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS



SIZES ¼ TO 3 INCH
No. 440
CODE: ANTENNAL

SIZES 2, 2½ AND 3 INCH
No. 441
CODE: ANTEPONEVA

Size.....Inches	¼	⅜	½	¾	1	1¼	1½
Size.....Millimeters	6	10	13	19	25	32	38
No. 440, Screwed.....Each	1.45	1.45	1.65	2.05	2.80	3.70	5.00

Size.....Inches	2	2½	3
Size.....Millimeters	50	64	76
No. 440, Screwed.....Each	7.30	13.00	19.00
No. 441, Flanged.....Each	25.00	33.00	39.00
Diameter of Flanges.....Inches	6	7	7½
Face to Face, Flanged.....Inches	5 5/16	6	6 15/16

These Valves are constructed with Parallel Seats and the bearing of the Wedging device acts uniformly on all parts of the discs, insuring an equal bearing on all parts of the faces of the discs against the seats.

They are tested under steam pressure, and we have at various times subjected them to a hydraulic pressure of 400 to 700 pounds, without leaking, but we do not recommend them for more than the steam working pressures as stated above.

These valves when wide open may be repacked while under pressure.

Templates for drilling page 595. Price List for drilling, page 483.

STANDARD BOLTED BONNET

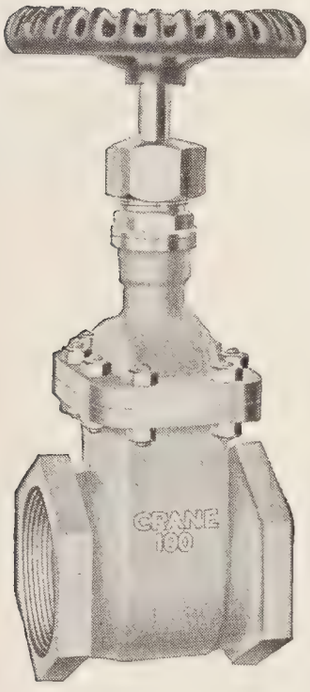
GATE VALVES

BRASS

NON-RISING STEM

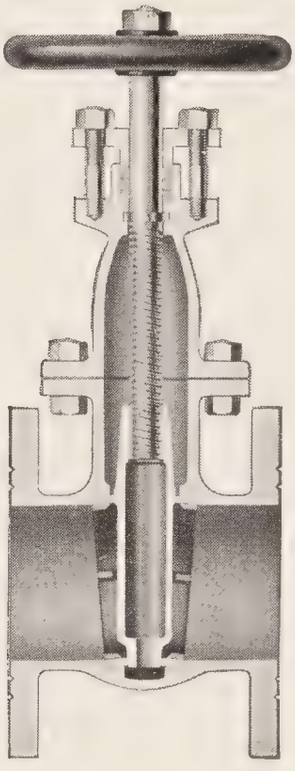
No. 440 AND No. 441 HAVE DOUBLE DISC, PARALLEL SEATS
No. 4435 HAS SINGLE WEDGE DISC, TAPER SEATS

FOR STEAM WORKING PRESSURES UP TO 100 POUNDS



SIZES 3½ TO 6 INCHES
No. 440

CODE: ANTEVIABAM



No. 4435

CODE: ANTHEMUSIA

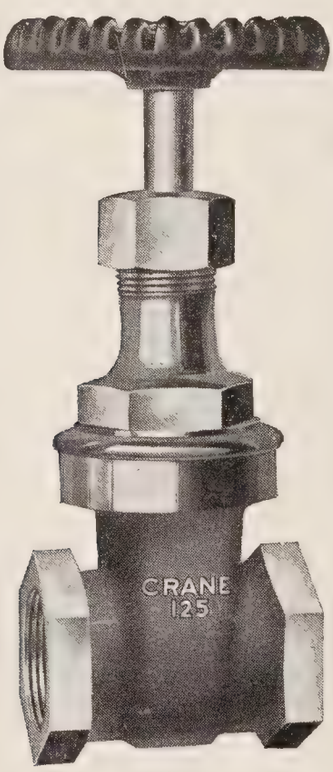
Size	Inches	3½	4	5	6
Size	Millimeters	90	100	125	150
No. 440, Screwed	Each	43.00	58.00	110.00	165.00
No. 441, Flanged	Each	68.00	83.00	135.00	190.00
Diameter of Flanges	Inches	8½	9	10	11
Face to Face, Flanged	Inches	6¼	7	9¼	10¾

THE No. 4435 VALVES ARE MADE TO ORDER ONLY IN SIZES AND WITH FACE TO FACE DIMENSIONS AS BELOW: PRICES ON APPLICATION

Size	Inches	3	3½	4	4½	5	6
Size	Millimeters	76	90	100	113	125	150
No. 4435 Face to Face	Inches	6½	7	7½	8	8¼	8¾
Diam. of Flanges	Inches	7½	8½	9	9¼	10	11

STANDARD
DOUBLE DISC GATE VALVES
BRASS
TAPER SEATS RISING STEM

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS



No. 440½

CODE: APARTADIJO

Size.....Inches	¼	⅜	½	¾	1	1¼	1½	2	2½	3
Size.Millimeters	6	10	13	19	25	32	38	50	64	76
Price.....Each	1.45	1.45	1.65	2.05	2.80	3.70	5.00	7.30	13.00	19.00

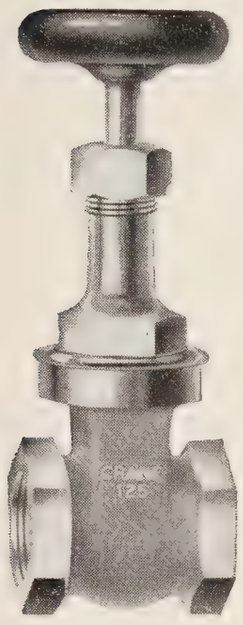
These Valves are made with Taper Seats, with Self-Adjusting Discs having their bearings near the outer edge, to bring the Discs tightly and uniformly to their seats.

They are tested under steam pressure, and we have at various times subjected them to a hydraulic pressure of 500 to 1,000 pounds, without leakage, but, as stated above, we do not recommend them for more than the steam working pressure of 125 pounds.

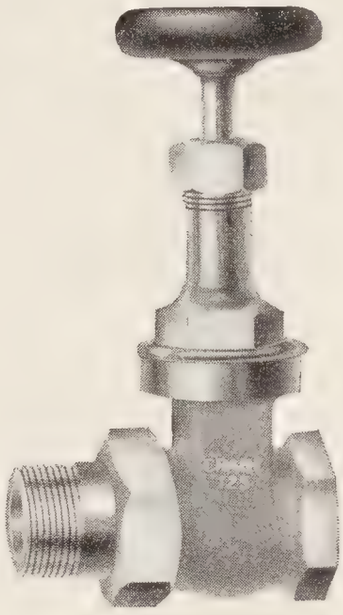
STANDARD
DOUBLE DISC GATE VALVES
WITH SPECIAL WHEELS AND FINISH
BRASS

PARALLEL SEATS RISING STEMS

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS



No. 444
WOOD WHEEL
CODE: APEGABAN



No. 446
WOOD WHEEL WITH UNION
CODE: APEPINADA

No. 448
FINISHED BRASS WHEEL
CODE: APEXABONE

No. 444 WOOD WHEEL

Size							
Size	Inches	½	¾	1	1¼	1½	2
Size	Millimeters	13	19	25	32	38	50
Price, Rough Body, Plain	Each	2.00	2.55	3.40	4.50	6.00	8.90
Price, Rough Body, Plated all over	Each	2.40	3.00	3.85	5.00	6.60	9.65
Price, Finished all over	Each	3.30	4.00	5.10	6.75	9.00	13.90
Price, Finished and Plated all over	Each	3.70	4.50	5.60	7.35	9.70	14.80

No. 446 WOOD WHEEL WITH UNION

Size							
Size	Inches	½	¾	1	1¼	1½	2
Size	Millimeters	13	19	25	32	38	50
Price, Rough Body, Plain	Each	3.20	3.75	4.65	6.00	8.25	11.90
Price, Rough Body, Plated all over	Each	3.65	4.25	5.20	6.60	9.00	12.80

No. 448 FINISHED BRASS WHEEL

Size					
Size	Inches	½	¾	1	1¼
Size	Millimeters	13	19	25	32
Price, Rough Body, Plain	Each	2.90	3.30	4.65	5.85
Price, Finished all over	Each	4.15	4.80	6.35	8.10
Price, Finished and Plated all over	Each	4.60	5.30	6.95	8.80
Size	Inches	1½	2	2½	3
Size	Millimeters	38	50	64	76
Price, Rough Body, Plain	Each	7.60	10.60	16.70	24.30
Price, Finished all over	Each	10.60	15.60	24.00	35.00
Price, Finished and Plated all over	Each	11.40	16.50	25.25	36.75

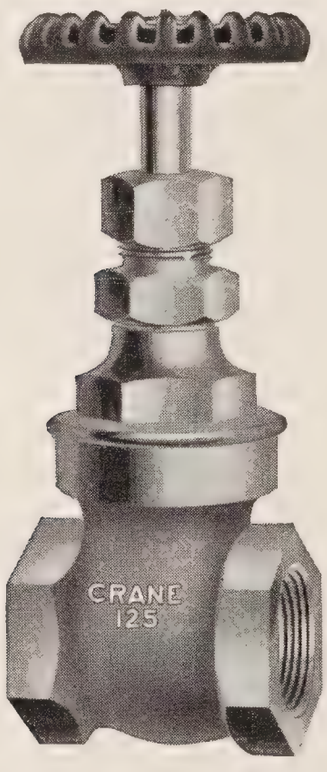
These Valves are made to order only.
Can be furnished with lock and shield when so ordered, at a special price.
These Valves are the No. 440 type as shown on page 40.
The following describes the style of finish: Rough Body Plain is the Regular Brass Valve Casting. Rough Body Plated is the Regular Brass Valve Casting, Nickel Plated. Finished All Over is the Brass Valve Casting, Smooth Finished and Polished. Finished and Plated is the Brass Valve Casting, Smooth Finished, Nickel Plated and Polished All Over.

STANDARD
WEDGE GATE VALVES

BRASS

NON-RISING STEM

WITH A GLAND IN THE STUFFING BOX
FOR STEAM WORKING PRESSURES UP TO 125 POUNDS



No. 438

CODE: APIANARUM

Size.....Inches	¼	⅜	½	¾	1	1¼	1½	2	2½	3
Size.Millimeters	6	10	13	19	25	32	38	50	64	76
Price.....Each	1.45	1.45	1.65	2.05	2.80	3.70	5.00	7.30	13.00	19.00

These Valves have been designed for general service and are recommended with fullest confidence for use wherever Brass Gate Valves for this pressure are desired.

The guides on the Discs and the ribs in the bodies of these Valves are accurately fitted, which insures true and easy movement, prevents wear of the faces, and also prevents the Discs from touching the Seats in the bodies except at the point of closing.

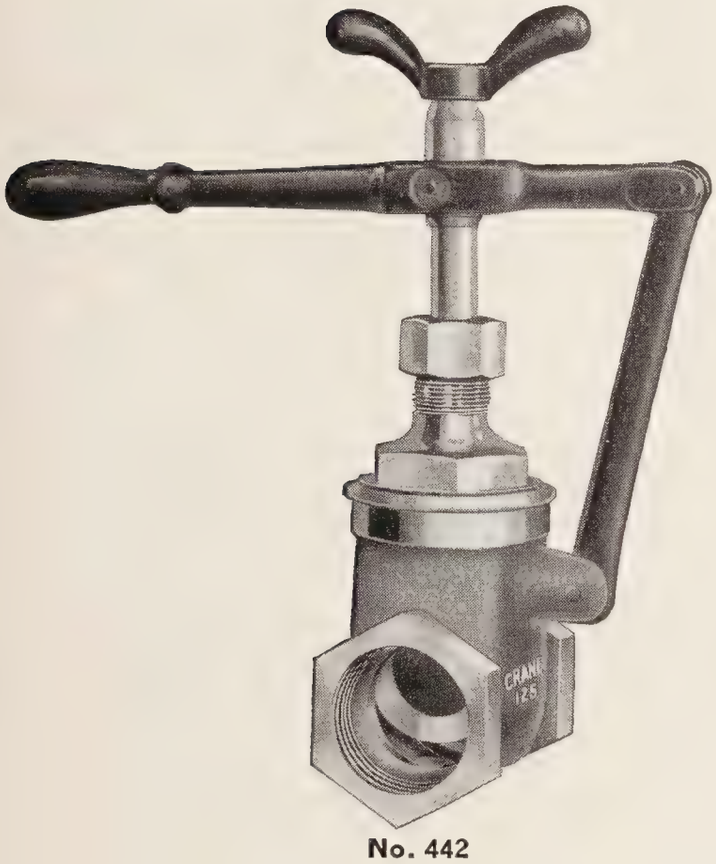
These Valves are regularly tested with steam. At times we have subjected these Valves to hydraulic pressures ranging from 500 to 1,000 pounds, without leaking, but do not recommend them for more than the steam working pressure specified, as it is not only a question of the Valves withstanding the higher pressures, but also the strain of expansion and contraction, the weight of piping, settling, and the cutting effects of the steam on the Discs and Seats.

These Valves when wide open may be repacked while under pressure.

QUICK OPENING

BRASS GATE VALVES

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS



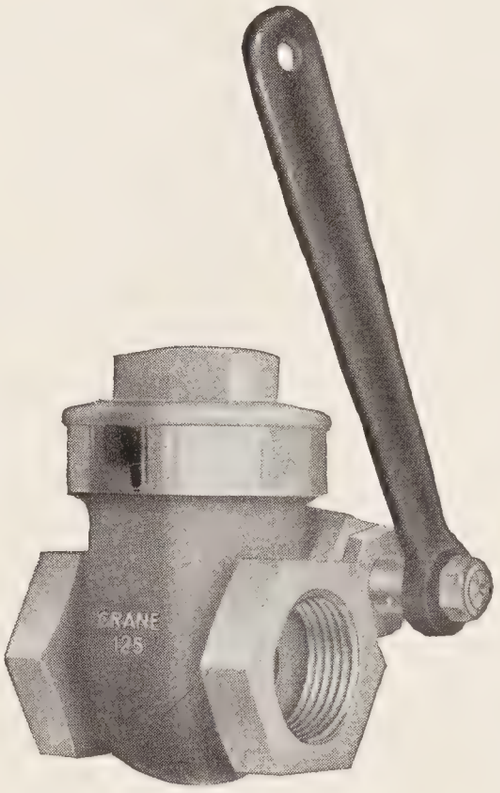
No. 442

WITH PARALLEL SEATS

DOUBLE DISCS

SLIDING STEM

CODE: APLASTABAN



No. 442½

WITH TAPER SEATS

DOUBLE WEDGING DISCS

ROTATING STEM

CODE: APLIQUEMOS

Size.....Inches	½	¾	1	1¼	1½	2	2½	3
Size.....Millimeters	13	19	25	32	38	50	64	76
No. 442, Screwed.....Each		3.60	4.80	6.20	8.50	11.80	20.25	30.00
No. 442½, Screwed.....Each	3.50	3.60	4.80	6.20	8.50	11.80	20.25	30.00

These valves are made with Screwed Ends only.

On the No. 442, the winged nut at top of the stem, locks the disc at any desired opening.

The No. 442½ Valves are so constructed that they may be installed in pipe lines where the space is limited, and the construction is such as to eliminate the likelihood of the discs binding or sticking when installed in any position.

HEAVY STANDARD

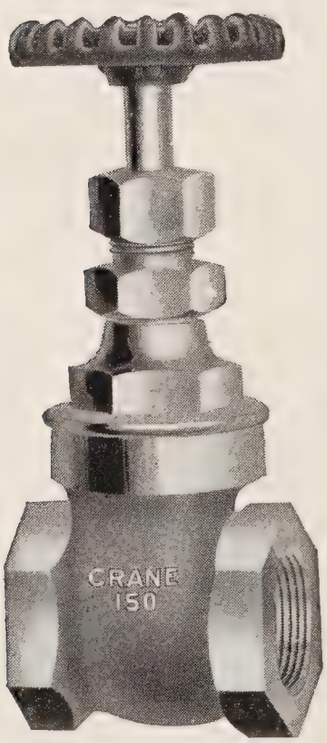
WEDGE GATE VALVES

CRANE SPECIAL BRASS

NON-RISING STEM

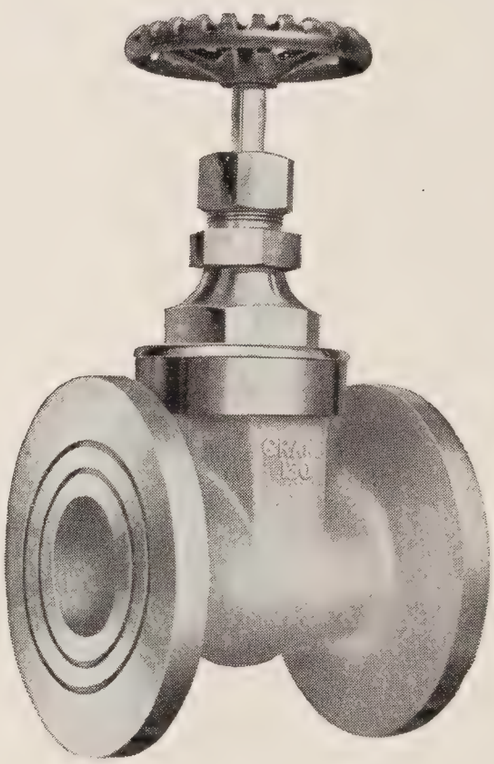
WITH A GLAND IN THE STUFFING BOX

FOR STEAM WORKING PRESSURES UP TO 150 POUNDS



No. 437, SCREWED

CODE: APODOME



No. 437½, FLANGED

CODE: APOJADURA

Size ..... Inches	¼	⅜	½	¾
Size ..... Millimeters	6	10	13	19
No. 437, Screwed ..... Each	1.45	1.45	1.65	2.05

Size ..... Inches	1	1¼	1½	2	2½	3
Size ..... Millimeters	25	32	38	50	64	76
No. 437, Screwed ..... Each	2.80	3.70	5.00	7.30	13.00	19.00
No. 437½, Flanged ..... Each	10.25	12.00	15.00	25.00	33.00	39.00
Face to Face, Flanged ..... Inches	3⅜	3⅞	4⅜	5½	6½	7½
Diameter of Flanges ..... Inches	4	4½	5	6	7	7½

To our extensive line of Valves the No. 437 and No. 437½ Heavy Standard Gate Valves have been added. These are heavier proportioned and of greater weight than Standard Valves.

We have subjected these Valves to hydraulic pressures ranging from 700 to 3,000 pounds, with Valves closed and pressure against the disc, without leaking, and with Valves open we have tested the bodies to pressures ranging from 1,000 to 3,000 pounds without leaking, but they are not recommended for more than the working pressure specified.

These Valves when wide open may be repacked while under pressure.

Templates for drilling, page 595. Price List for drilling, page 483.

MEDIUM GATE VALVES

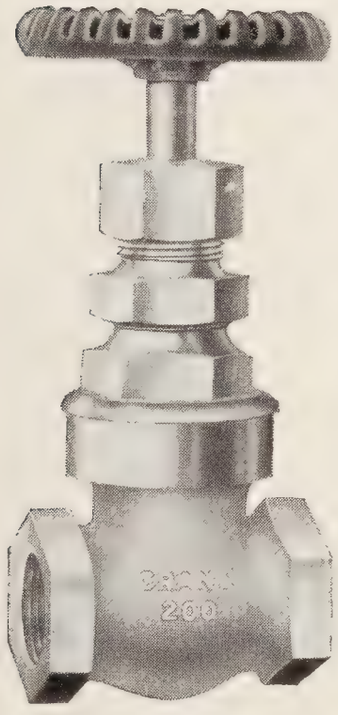
CRANE SPECIAL BRASS

WITH GLAND — WEDGE DISC

OPEN TO LEFT

NON-RISING STEM — OUTSIDE SCREW AND YOKE

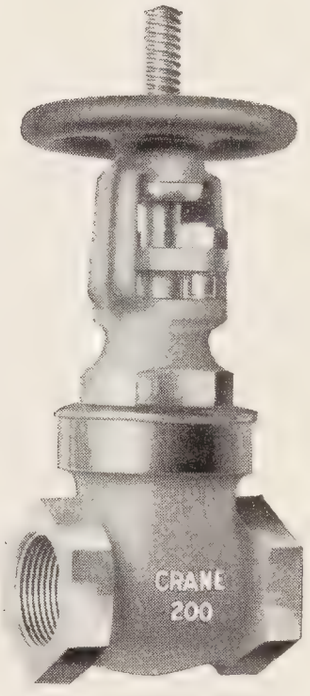
FOR STEAM WORKING PRESSURES:
SCREWED VALVES UP TO 200 POUNDS
FLANGED VALVES UP TO 150 POUNDS



NON-RISING STEM,

No. 458. SCREWED
CODE: APORTELADO

No. 458½ FLANGED
CODE: APOSKEME



OUTSIDE SCREW AND YOKE.

No. 459. SCREWED
CODE: APTABAMINI

No. 459½ FLANGED
CODE: APUCARANNA

Size.....Inches	⅜	½	¾	1	1¼	1½	2	2½	3
Size.....Millimeters	10	13	19	25	32	38	50	64	76
458 Screwed.....Each	2.35	2.75	3.25	4.50	6.00	8.00	13.00	20.00	32.50
458½ Flanged.....Each		9.25	10.50	12.50	15.00	20.00	29.00	41.00	58.00
459 Screwed.....Each		7.50	8.75	10.25	12.00	15.00	22.00	32.00	
459½ Flanged.....Each		14.00	16.00	18.25	21.00	27.00	38.00	53.00	
Face to Face, Flanged. Inches		3	3¼	3⅝	4¼	4⅞	6	6⅞	8⅛
Diameter of Flanges...Inches		3	3½	4	4½	5	6	7	7½

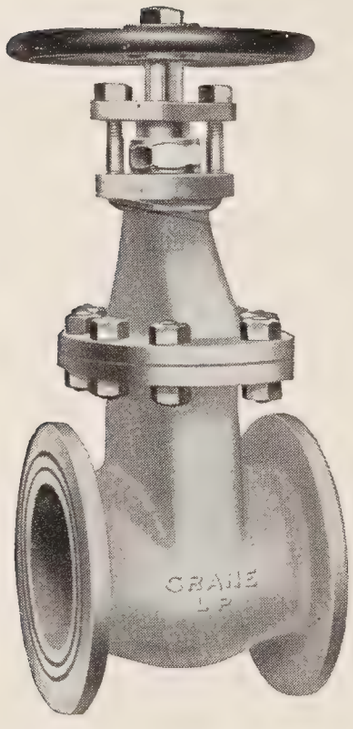
The No. 458 Non-Rising Stem Valves are of a heavy pattern, but otherwise they are similar in construction to our No. 438 Straight-Way Wedge Gate Valves, as shown and described on page 44.

These Valves when wide open may be repacked while under pressure.

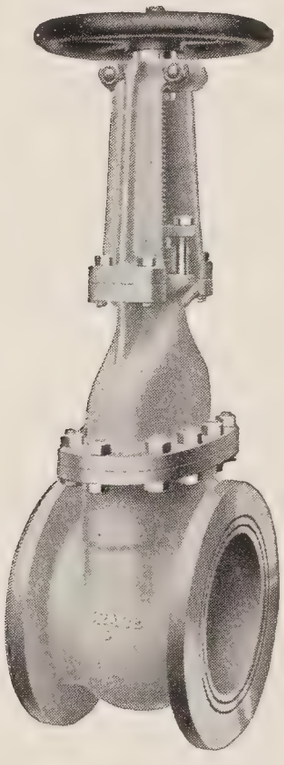
The Outside Screw and Yoke Valve sizes ½ to 2 inch inclusive, are designed in accordance with the rules and requirements of the National Fire Protection Association. These Valves are marked "C U" to denote their use for fire protection service.

Templates for Drilling, page 595. Price List for drilling, page 484.

BRASS GATE VALVES
FOR
MARINE SERVICE

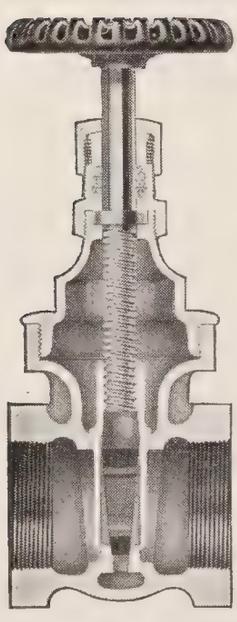


No. 4435, LOW PRESSURE

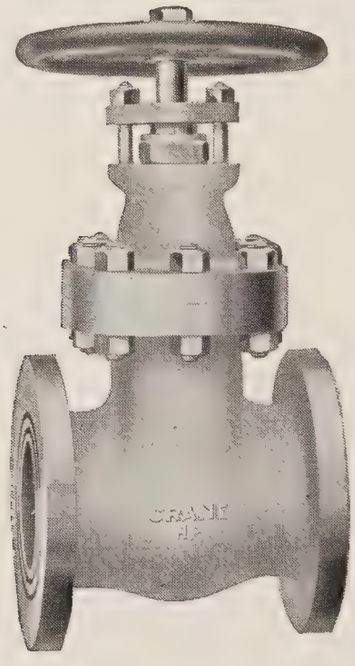


No. 4435, LOW PRESSURE
OUTSIDE SCREW AND YOKE

CODE: AQUATINTER



No. 437, HEAVY STANDARD
CODE: AQUELARRES



No. 4037-E, EXTRA HEAVY
CODE: AQUILASTRO

WE MANUFACTURE A COMPLETE LINE OF VALVES AND FITTINGS FOR MARINE SERVICE

WRITE US FOR INFORMATION AND PRICES

EXTRA HEAVY

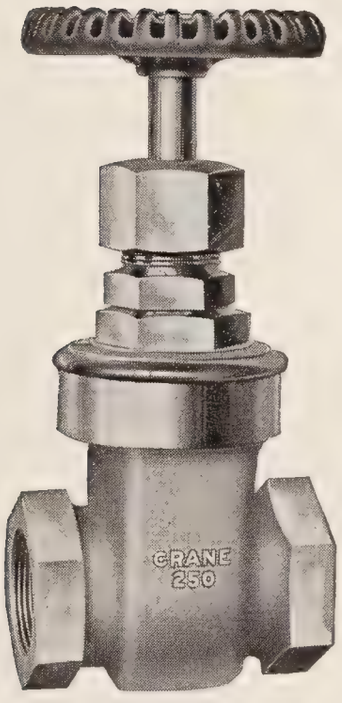
WEDGE GATE VALVES

CRANE SPECIAL BRASS

NON-RISING STEM

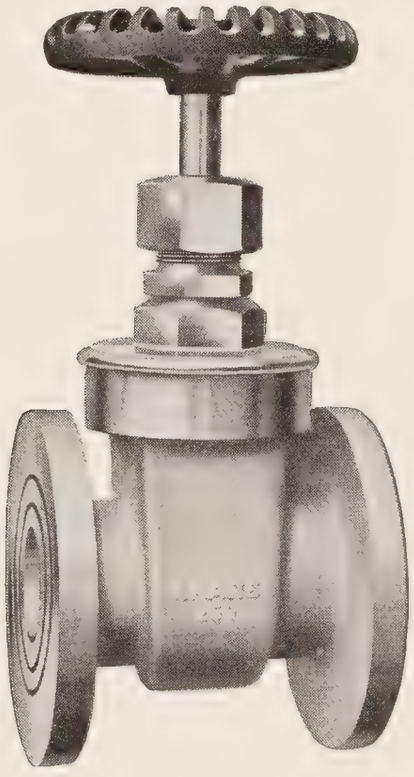
WITH A GLAND IN THE STUFFING BOX

FOR SATURATED STEAM WORKING PRESSURES UP TO 250 POUNDS.
FOR WATER WORKING PRESSURES UP TO 350 POUNDS.



No. 66E

CODE: AQUINUM



No. 67E

CODE: ARABATTA

Size.....Inches	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3
Size.....Millimeters	10	13	19	25	32	38	50	64	76
No. 66E, Screwed....Each	4.00	5.00	6.00	8.00	11.25	16.50	23.00	40.00	65.00
No. 67E, Flanged.....Each				16.00	21.50	30.00	41.00	65.00	100.00
Diameter of Flanges.Inches				4 1/2	5	6	6 1/2	7 1/2	8 1/4
Face to Face, Flanged..Inches				4 5/16	4 9/16	5 5/16	6 3/16	7 1/8	8 3/16

These Valves are extra heavy in all parts and are especially designed for high pressure steam work. All of the Brass Parts are made of "Crane Special Brass," the merits of which are fully described on page 2.

These Valves when wide open may be repacked while under pressure.

Templates for Drilling, page 595.

Price List for Drilling, page 484.

EXTRA HEAVY

WEDGE GATE VALVES

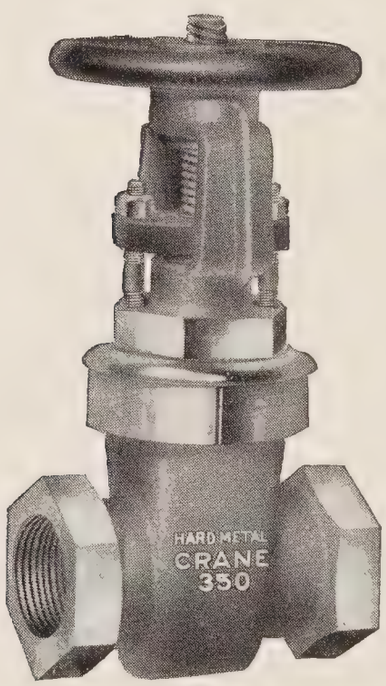
CRANE HARD METAL (BRONZE)

OUTSIDE SCREW AND YOKE WITH A GLAND IN THE STUFFING BOX

FOR SATURATED STEAM WORKING PRESSURES UP TO 350 POUNDS

FOR SUPERHEATED STEAM WORKING PRESSURES UP TO 250 POUNDS AND A TOTAL TEMPERATURE OF 700 DEGREES FAHRENHEIT.

FOR HYDRAULIC WORKING PRESSURE UP TO 800 POUNDS IN LINES NOT SUBJECT TO SHOCK



No. 68E

CODE: ARAGALE

Size.....Inches	¾	1	1¼	1½	2
Size.....Millimeters	19	25	32	38	50
No. 68E, Screwed.....Each	10.00	13.00	17.00	23.00	35.00

These Valves are extra heavy in all parts and are especially designed for high pressure superheated steam work. The Body and Disc are made of Crane Hard Metal (Bronze), the merits of which are fully described on page 2.

These Valves when wide open may be repacked while under pressure.

HYDRAULIC

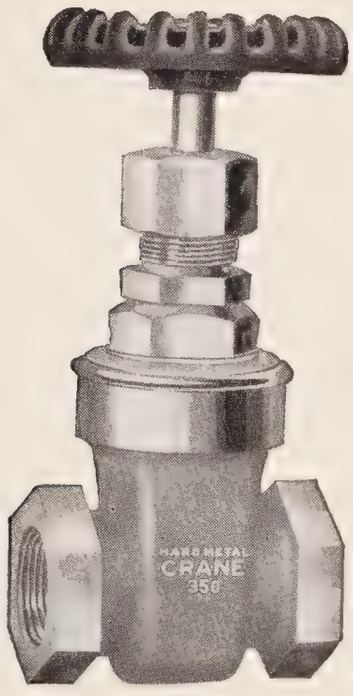
WEDGE GATE VALVES

CRANE HARD METAL (BRONZE)

WEDGE GATE OPEN TO THE LEFT NON-RISING STEM

FOR COLD WATER OR OIL WORKING PRESSURES
UP TO 800 POUNDS HYDROSTATIC

TESTED TO 800 POUNDS HYDROSTATIC PRESSURE WITH VALVE OPEN AND CLOSED



No. 230 H
CODE ARATIGOACU

Size.....Inches	½	¾	1	1¼	1½	2
Size.....Millimeters	13	19	25	32	38	50
Price.....Each	7.50	9.00	12.00	15.50	22.50	34.50

WORKING PRESSURES

These Valves are suitable for the working pressures specified above when used in hydraulic installations in which shock is absent or so slight as to be negligible. WHEN SUBJECT TO SHOCK they are recommended for 350 pounds pressure. See explanatory notes on page 175.

AIR OR GAS

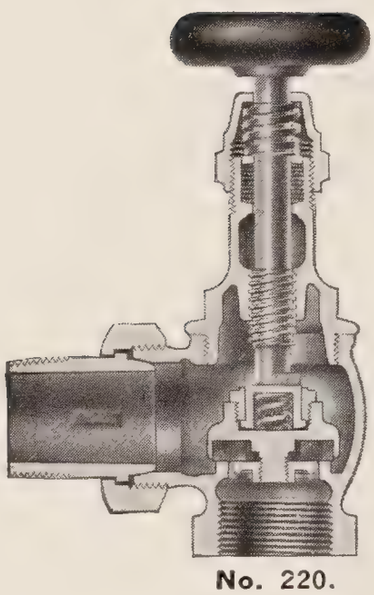
Small Valves for Air and Gas should be Globe and Angle Types. See pages 37 and 38.

THE BODIES AND WEDGE GATES OF THESE VALVES ARE MADE OF "HARD METAL"

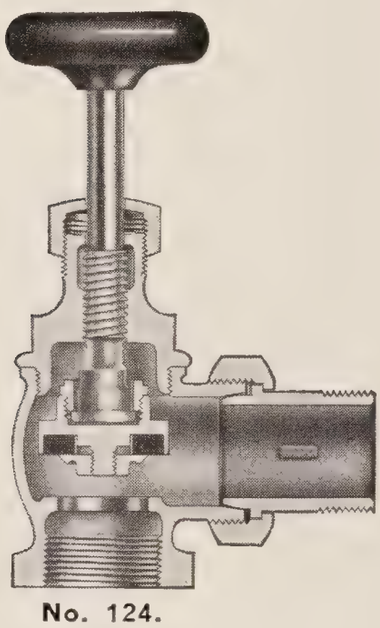
These Valves when wide open may be repacked while under pressure.

When larger sizes are wanted we recommend lines of Gate Valves shown on pages 173 to 178.

CRANE
RADIATOR VALVES
BRASS



No. 220.
STEAM



No. 124.
STEAM

ON THE FOLLOWING PAGES OUR COMPLETE LINE OF

STEAM AND HOT WATER

RADIATOR VALVES

IS SHOWN, TOGETHER WITH

AUTOMATIC AND COMPRESSION AIR VALVES

All Crane Steam Radiator Valves are furnished with Crane Renewable Discs.

When the **STEAM TYPE** of Radiator Valves are to be used for gravity hot water service, they are furnished with a small hole through the bridge wall which insures circulation when the Valve is closed. Regular Hot Water Valves are always furnished with this hole through the disc.

RADIATOR VALVES

FOR HOT WATER

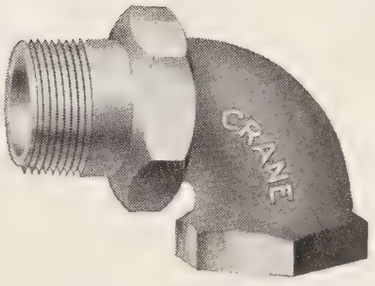
BRASS

No. 174
CODE: ARDALEARLE

RADIATOR UNION ELBOWS

FOR HOT WATER

BRASS



No. 192
CODE: ARDEBATIS

RADIATOR VALVES

Size.....Inches	½	¾	1	1¼	1½	2
Size.....Millimeters	13	19	25	32	38	50
No. 174, Rough Body, Plated all over. Each	3.25	3.70	4.50	5.75	7.30	12.00

These Valves have a brass plate fitted on top of the wheel with an arrow which indicates whether the Valve is open or closed. It is open when the arrow points in the direction of the side opening of Valve; a quarter turn closes it.

The construction of the Valve is such that there is no obstruction, the full area of the pipe being maintained.

A hole in the disc allows for circulation when the Valve is closed.

RADIATOR UNION ELBOW

Size.....Inches	½	¾	1	1¼	1½	2
Size.....Millimeters	13	19	25	32	38	50
No. 192, Rough Body, Plated all over. Each	1.75	2.00	2.50	3.30	4.25	7.20

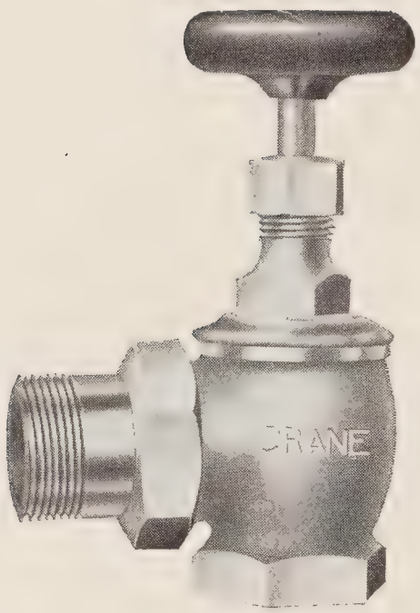
For General Dimensions see Page 668.

RADIATOR VALVES

BRASS

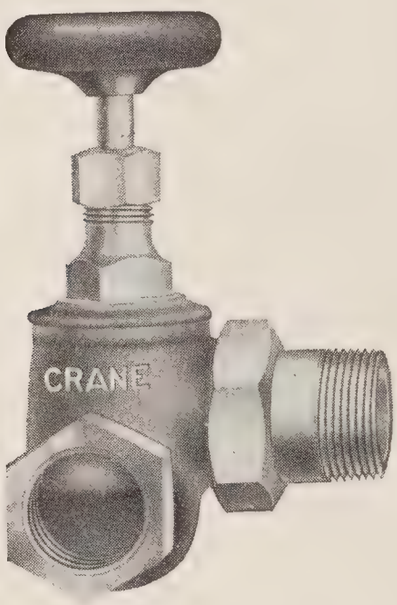
WITH CRANE RENEWABLE DISC

WOOD WHEEL



No. 112
WITH UNION OUTLET

CODE: ARGUTAVIT



No. 113
CORNER VALVE WITH UNION OUTLET

CODE: ARGWANEND

Size.....Inches	½	¾	1	1¼	1½	2
Size.....Millimeters	13	19	25	32	38	50
No. 112, Rough Body, Plated all over. Each	3.70	4.30	5.10	6.40	8.40	13.60
No. 113, Rough Body, Plated all over. Each	4.10	4.75	5.60	7.05	9.25	15.00

No. 113 Corner Valves are made either Right Hand or Left Hand.

In ordering Corner Radiator Valves, state whether Right Hand or Left Hand Corner Valves are wanted.

The term Right Hand or Left Hand Corner Valve is fixed as follows: A Right Hand Valve has the Union Outlet of the Valve at the Right when looking into the Inlet. The Left Hand Valve has the Union Outlet to the Left.

Finished Valves and Finished and Plated Valves will be made to order at a special price.

For General Dimensions see page 668.

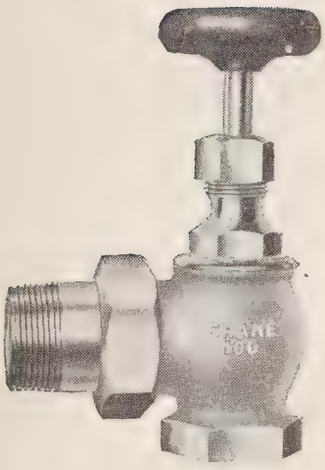
STANDARD

RADIATOR VALVES

BRASS

WITH CRANE RENEWABLE DISC

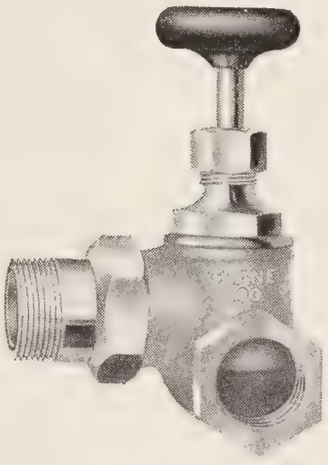
WOOD WHEEL



No. 124

WITH UNION OUTLET

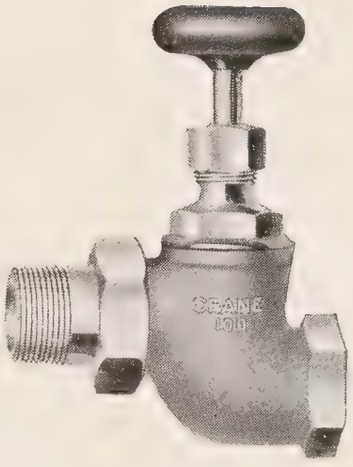
CODE: ARNOBIUS



No. 144

CORNER VALVE
WITH UNION OUTLET

CODE: ARONDELLE



No. 164

OFFSET VALVE
WITH UNION OUTLET

CODE: ARPEGIABA

No. 124 VALVE WITH UNION OUTLET

Size..... Inches	¾	1	1¼	1½	2
Size..... Millimeters	19	25	32	38	50
No. 124, Rough Body, Plated all over..... Each	4.30	5.10	6.40	8.40	13.60

No. 144 CORNER VALVE WITH UNION OUTLET

Size..... Inches	½	¾	1	1¼	1½	2
Size..... Millimeters	13	19	25	32	38	50
No. 144, Rough Body, Plated all over..... Each	4.10	4.75	5.60	7.05	9.25	15.00

No. 164 OFFSET VALVE WITH UNION OUTLET

Size..... Inches	¾	1	1¼	1½	2
Size..... Millimeters	19	25	32	38	50
No. 164, Rough Body, Plated all over..... Each	4.75	5.60	7.05	9.25	15.00

No. 144 Corner Valves are made either Right Hand or Left Hand.

Finished Valves and Finished and Plated Valves are made to order at a special price.

To facilitate ordering: Simply state size and number; the number sufficiently indicates the style and finish with the exception of the Corner Radiator Valves.

In ordering Corner Radiator Valves always give Valve number and size, and state whether Right Hand or Left Hand Valves are wanted. The term Right Hand or Left Hand Corner Valve is fixed as follows: A Right Hand Valve has the union outlet of the valve at the Right when looking into the inlet. The Left Hand Valve has the union outlet to the left.

Offset Valves are made to order only.

For general dimensions, see page 668.

STANDARD

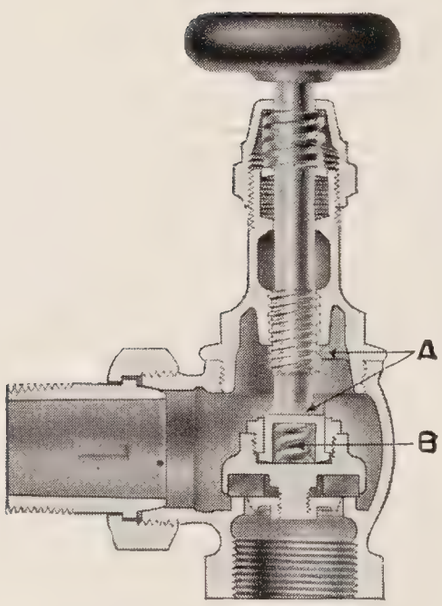
STEAM OR VACUUM SYSTEM RADIATOR VALVES

BRASS

SELF-ADJUSTING PACKED STUFFING BOX

CRANE RENEWABLE DISC

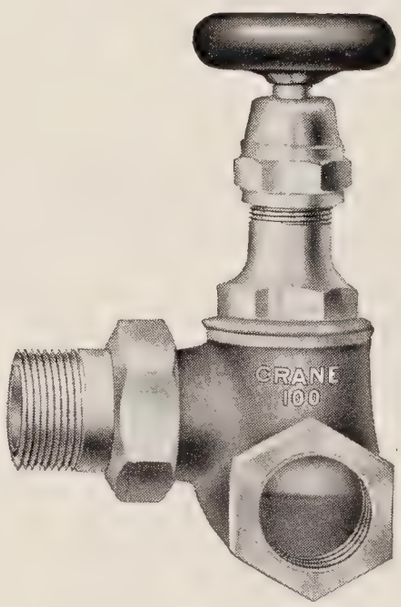
(Patented)



No. 220

WITH UNION OUTLET

CODE: ARTABEKEN



No. 222

CORNER VALVE
WITH UNION OUTLET

CODE: ARTAMESIA

Size.....Inches	½	¾	1	1¼	1½	2
Size.....Millimeters	13	19	25	32	38	50
No. 220, Rough Body, Plated all over. Each	3.15	3.90	4.70	6.25	8.15	13.00
No. 222, Rough Body, Plated all over. Each	3.45	4.25	5.15	6.95	8.95	14.25

The illustration shows at "A" the Crane Patent Stop, which consists of a lug in center piece casting and a lug on the stem of the Valve. These lugs, when the Valve is wide open, prevent the jamming and sticking of the Disc in the open position.

The Auxiliary Spring at "B" automatically compensates for any shrinkage in the Disc, and prevents leakage when the Valve is closed and the Disc cools and contracts.

These Valves are superior to all so-called Packless Valves, as there is but one Radiator Valve without packing. All others make use of a packing, usually in a most inaccessible location.

Finished Valves and Finished and Plated Valves will be made to order at a special price.

The No. 222 Valves are made either Right Hand or Left Hand.

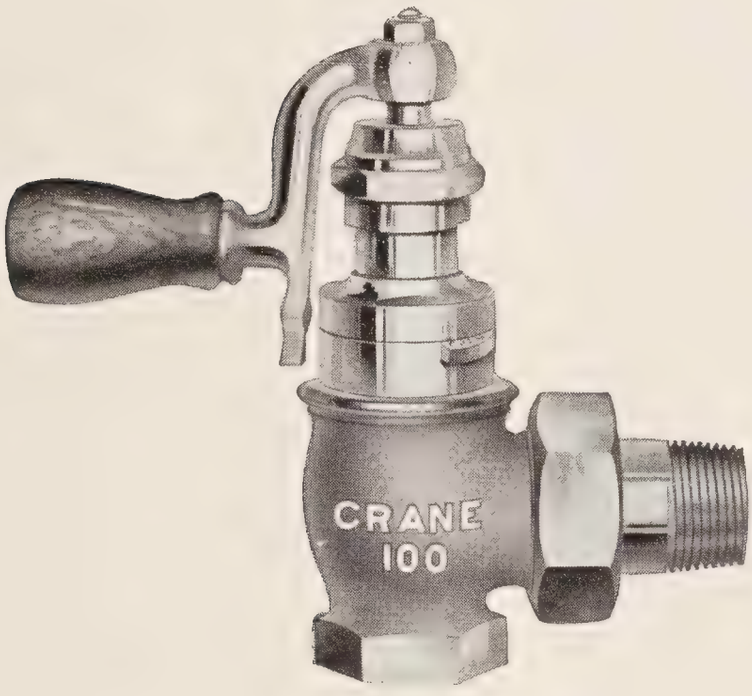
In ordering state whether Right Hand or Left Hand Corner Valves are wanted.

The term Right Hand or Left Hand Corner Valve is fixed as follows: A Right Hand Valve has the Union Outlet of the Valve at the Right when looking into the inlet. The Left Hand Valve has the Union Outlet to the Left.

For General Dimensions see page 668.

STANDARD
MODULATING RADIATOR VALVES
BRASS
SELF-ADJUSTING PACKED STUFFING BOX

(Patented)



No. 231 WITH UNION OUTLET

CODE: ARTHRALGIA

Size.....Inches	½	¾	1	1¼
Size.....Millimeters	13	19	25	32
Price, Rough Body, Plated all over.....Each	3.15	3.90	4.70	6.25

These Valves allow control of the steam flow to each radiator of a heating plant. These Valves may be adjusted to give the required maximum opening, without dismantling the Valve.

The amount of steam passing through the Valve depends on the area of the opening. By turning the handle the Valve may be opened by degrees according to requirements. Special shaped guides control the area of the opening.

It is a well-known fact that any Valve used to throttle steam will soon leak on account of the cutting action at the seat.

The construction of these Valves is such that the seat is to a degree protected from the action of the steam, is self-cleaning, insuring a complete shut-off and a longer life to the Valve. The throttling lip prevents the lodging of foreign matter on the seat.

These Valves are of a compact design and have a pleasing appearance.

The Valves are nickel plated, the finished parts polished and are supplied with a polished rosewood handle.

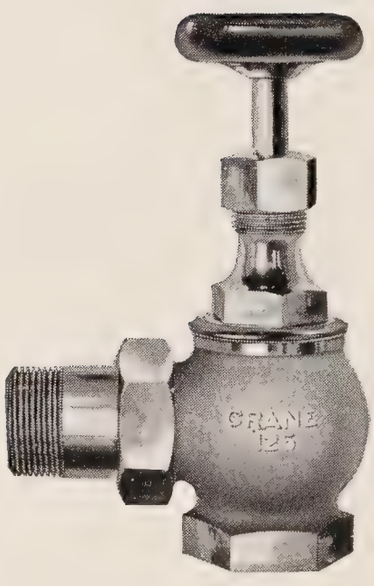
For General Dimensions, see page 668.

HEAVY
RADIATOR VALVES

BRASS

GOVERNMENT PATTERN
WITH CRANE RENEWABLE DISC

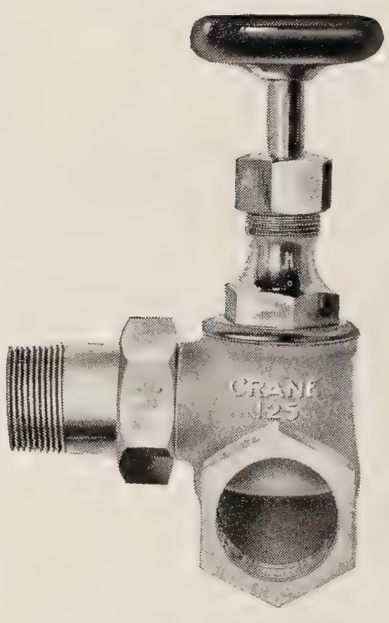
WOOD WHEEL



No. 67 G

WITH UNION OUTLET

CODE: ARTUATURUS



No. 145 G

CORNER VALVE
WITH UNION OUTLET

CODE: ARUNDELIAN

Size.....Inches	½	¾	1	1¼	1½	2
Size.....Millimeters	13	19	25	32	38	50
No. 67-G, Rough Body, Plated all over. Ea.	3.70	4.30	5.10	6.40	8.40	13.60
No. 145-G, Rough Body, Plated all over. Ea.	4.10	4.75	5.60	7.05	9.25	15.00

These Valves are heavier than Standard Pattern Radiator Valves.

They are especially adapted for use where a Heavier Valve is desired.

The No. 145-G Valves are made either Right Hand or Left Hand.

The term Right Hand or Left Hand Corner Valve is fixed as follows: A Right Hand Valve has the Union Outlet of the Valve at the Right when looking into the Inlet. The Left Hand Valve has the Union Outlet to the Left.

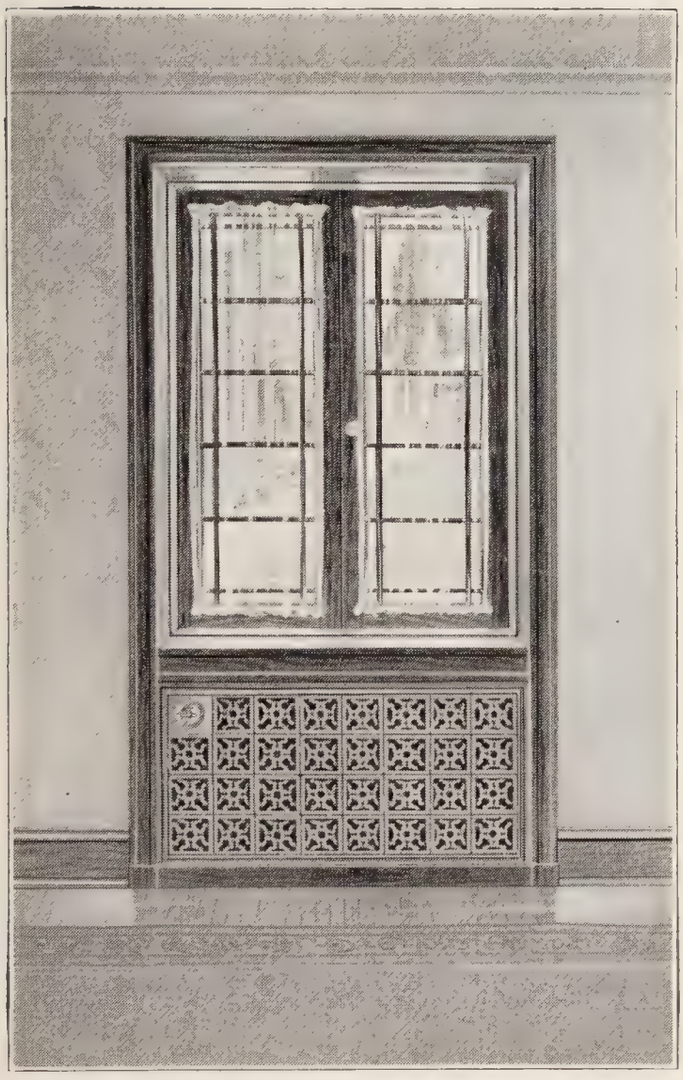
In ordering Corner Radiator Valves always give Valve number and size, and state whether Right Hand or Left Hand Valves are wanted.

Finished and Finished and Plated Valves will be made to order at a special price.

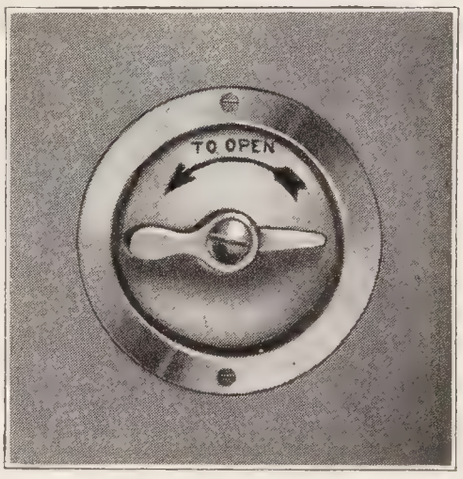
For General Dimensions see page 668.

PLATE AND HANDLE FOR USE WITH VALVES ON CONCEALED RADIATORS

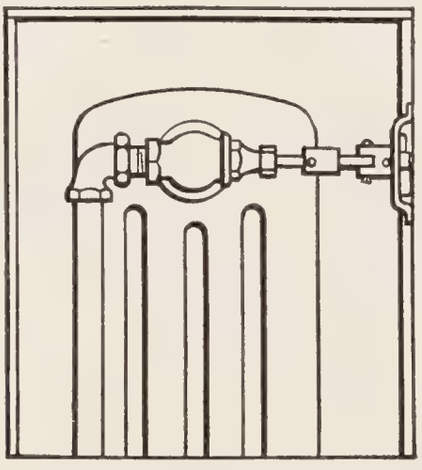
ADAPTABLE TO ALL CRANE STEAM OR HOT WATER RADIATOR VALVES



ELEVATION SHOWING PLATE AT TOP OF RADIATOR



PLAN SHOWING PLATE SET IN TOP COVER



ELEVATION SHOWING PLATE ON SIDE OF RADIATOR

CODE: ASCARENTO

Two types of Plates are furnished, as follows:

For use on Radiator Valves opening in one-half turn. This type is the same as shown above, except that it is marked "OPEN" and "SHUT."

For use on Radiator Valves opening in more than one-half turn. This type is illustrated above, and is marked "TO OPEN."

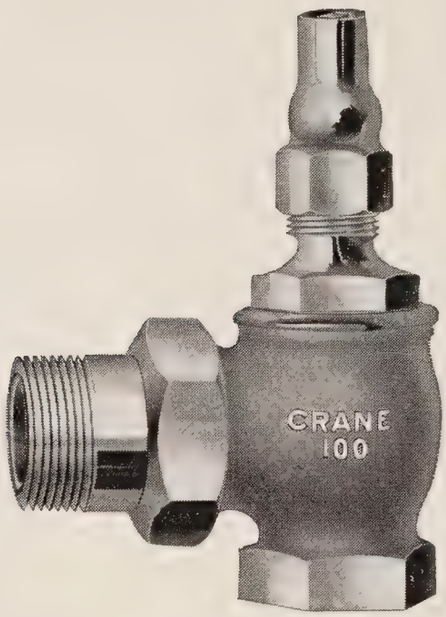
The complete operating mechanism consists of the Plate, handle, and extension stem, with proper parts for connecting the extension stem to the handle and to the valve stem.

Orders for this device should specify Catalogue Number and Size of Radiator Valve it is to be used with, and should give the distance from centerline of radiator valve to outside face of enclosure where plate is to be attached.

MADE TO ORDER ONLY

PRICES ON APPLICATION

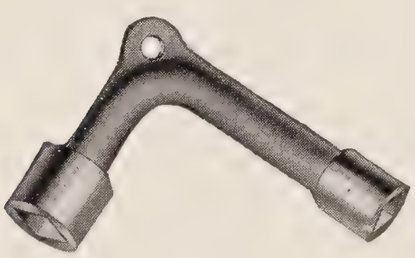
LOCK AND SHIELD RADIATOR VALVES



Any of our Radiator Valves, as shown on pages 54, 55 and 58 will be furnished with Lock and Shield, when so ordered, at the same price.

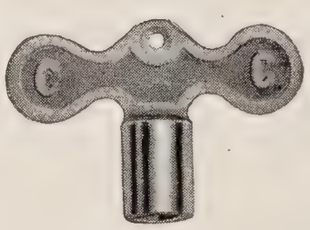
In describing the kind wanted, give Valve numbers, using words "Lock and Shield." Keys are extra as per list prices below.

KEYS FOR LOCK AND SHIELD VALVES



No. 198
CODE: ASCHBAKJE

No. 199
CODE: ASCHDAG



No. 200
CODE: ASCHENRUHE

*No. 198, Malleable Iron, Nickel Plated	Each	.70
*No. 199, Malleable Iron, Nickel Plated	Each	1.00
*No. 200, Brass	Each	.25

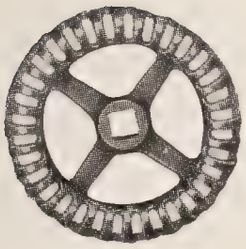
*The following table indicates which Keys will fit the various Valves, when equipped with Lock and Shield.

Size of Valve Inches	Size of Valve Millimeters	No. 48 Valve Use Key No.	Nos. 112–113 Valves Use Key No.	Nos. 124–144–164 Valves Use Key No.	Nos. 67G–145G Valves Use Key No.	Nos. 220–222 Valves Use Key No.
⅜	10	200				
½	13	200	200	198	198	198
¾	19	198	198	198	198	198
1	25	198	198	198	198–199	198
1¼	32	198–199	198	198–199	198–199	198–199
1½	38	198–199	198–199	198–199	199	198–199
2	50	199	198–199	199	199	199

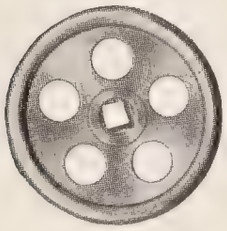
For Floor and Ceiling Plates and Floor Sleeves, see Pages 370 and 371

WHEELS AND HANDLES

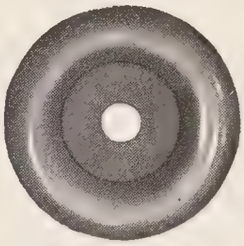
FOR BRASS VALVES



F
NON-HEATING WHEEL
MALLEABLE IRON
CODE: ASFODELADO



G
FINISHED WHEEL
BRASS
CODE: ASIDUIDAD



H
WOOD WHEEL
CODE: ASINALIBUS

J
TEE HANDLE
CAST IRON
CODE: ASKELON

K
LEVER HANDLE
MALLEABLE IRON
CODE: ASMADURA

The metal wheels shown are interchangeable.

F is our improved non-heating wheel, which is lighter and stronger and has more cooling surface than old style wheels. They do not become heated to such a temperature that they are uncomfortable to hold. The center is dished so that the brass nut on the end of the stem does not come in contact with the hand. With this style rim, the hand does not slip.

J is used on No. 50 Hose Valves, although it is interchangeable with Valves having metal wheels.

PRICE LIST OF WHEELS FOR STANDARD AND MEDIUM VALVES

EXTRA HEAVY AND HYDRAULIC VALVES REQUIRE LARGER SIZE WHEELS, AND ARE FURNISHED AT A SPECIAL PRICE

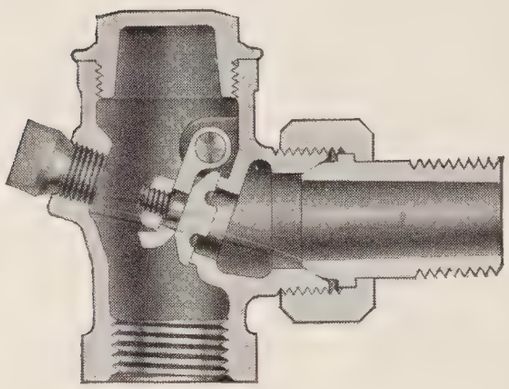
Size of Valve.....Inches	¼	⅜	½	¾	1	1¼	1½	2	2½	3
Size of Valve.....Millimeters	6	10	13	19	25	32	38	50	64	76
Style F.....Price Each	.08	.08	.08	.10	.12	.14	.16	.18	.20	.30
Style G.....Price Each	.60	.60	.70	.80	1.15	1.40	1.65	2.35	3.50	4.70
Style H.....Price Each	.10	.10	.10	.10	.10	.10	.10	.10		
Top and Bottom Plate and Screw for H.....	.10	.10	.10	.10	.10	.10	.10	.10		
Style J.....Price Each					.15	.20	.25	.30	.30	
Style K.....Price Each			.09	.12	.15	.18	.23	.40		

Order Wheels and Handles by size and number of Valve

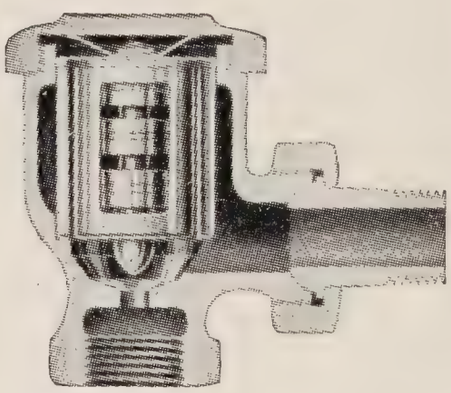
ACCESSORIES

FOR

MODULATING HEATING SYSTEMS



No. 39 ANGLE CHECK VALVE WITH UNION
CODE: ASPERGANT



No. 8 HOFFMAN RETURN LINE VALVE
CODE: ASPERGILE

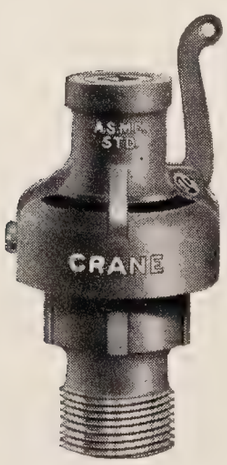
Size	Inches	½
Size	Millimeters	13
No. 39, Rough, not Plated	Each	3.55
No. 39, Rough, Plated	Each	3.85
No. 8, Hoffman	Each	6.00

The No. 39 Angle Check Valve is of the regrinding type, has large areas and no complicated parts.

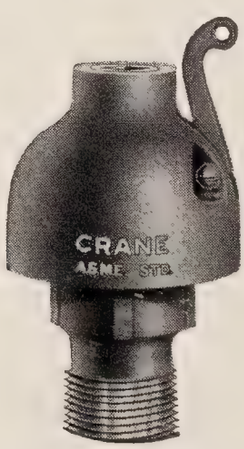
The No. 8 Hoffman can also be furnished in the corner pattern at an advanced price.

POP SAFETY VALVES

FOR STEAM HEATING BOILERS



No. 1165 CODE: ASPERJARAS
No. 1165-V CODE: ASPETADOR



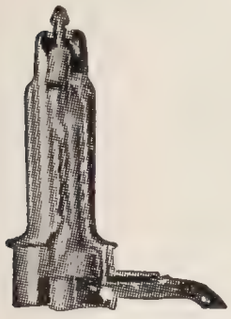
No. 1166 CODE: ASPETTAMMO
No. 1166-V CODE: ASPIDALIDE
No. 1167 CODE: ASPIDAM
No. 1167-V CODE: ASPIDISCUM

The No. 1165-V, 1166-V and 1167-V Pop Valves are especially ground at the seat so as to be tight on vapor heating systems.

For general description of Pop Valves for Low Pressure Heating Boilers, see page 182.

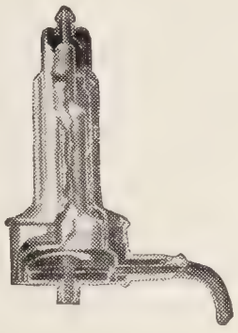
A VENTING VALVE FOR EVERY SERVICE

NO. 1
SIPHON AIR VALVE



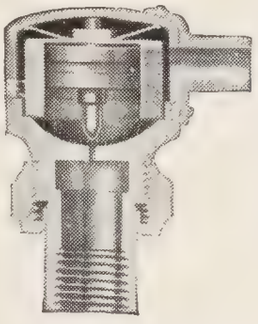
CODE: ASTEATODES

NO. 2
SIPHON AIR AND VACUUM VALVE



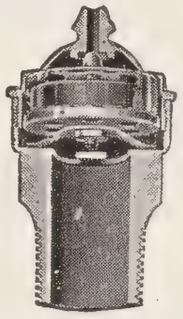
CODE: ASTELEPHAS

NO. 3
AIR LINE VALVE



CODE: ASTENSIUM

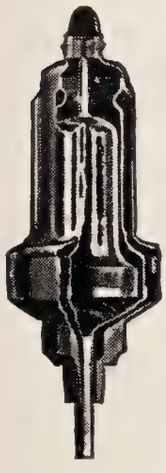
NO. 4
JUNIOR QUICK VENT AIR VALVE



CODE: ASTERNALE

Size	Inches	1/8	1/4
Number 1	Each	1.90	
Number 2	Each	4.50	
Number 3, 1/8″ Nipple Connection and 1/4″ Union	Each	2.50	
Number 4	Each		2.80

NO. 5
QUICK VENT FLOAT AIR VALVE



CODE: ASTHENIA

NO. 6
QUICK VENT FLOAT AIR AND VACUUM VALVE

CODE: ASTIAVANO

NO. 10
VAPOR VENT VALVE

CODE: ASTROFELS

DIFFERENTIAL LOOP

SECTION SHOWING INTERIOR

CODE: ASTROKYON

Size	Inches	3/8	3/4
Number 5	Each	8.00	
Number 6	Each	12.00	
Number 10	Each		25.00

THE HOFFMAN DIFFERENTIAL LOOP

FOR VAPOR HEATING

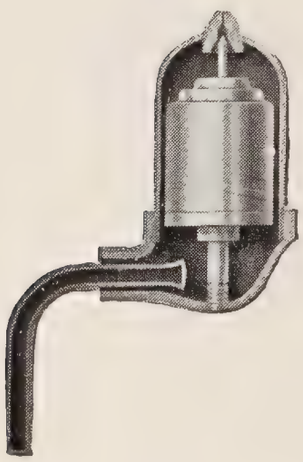
Its use makes vapor heating safe because it maintains, whenever pressure at boiler is above 10 ounces, a fixed pressure differential of 10 ounces between the steam main and the return main, thereby preventing the rise of water in the return.

Price on application.

RADIATOR AIR VALVES

AUTOMATIC

WARCO

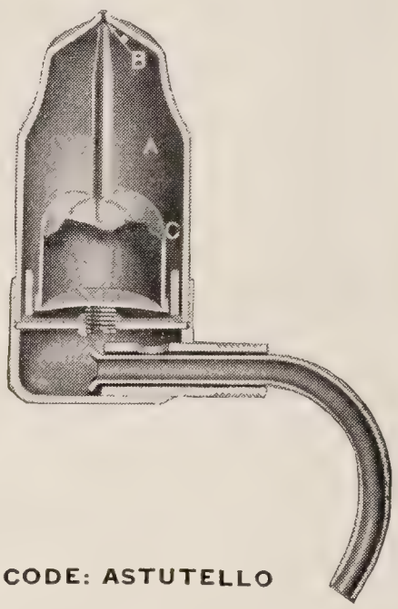


CODE: ASTULARUM

No. 1A

CODE: ASTUPEAMUS

IDEAL AIRID

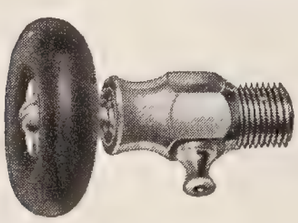


CODE: ASTUTELLO

Price, Warco	Each	1.25
Price, No. 1A	Each	1.25
Price, Ideal Airid	Each	2.00

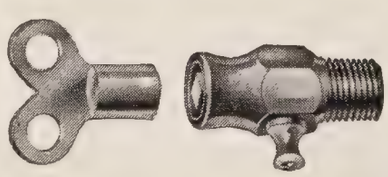
COMPRESSION

RADIATOR AIR VALVES



No. 206

CODE: ASTYMEDES



No. 210

CODE: ASUELVER

Size	Inches	1/8
No. 206, Wood Wheel, Plated	Each	.70
No. 210, Lock Shield, Plated	Each	.57
Keys for No. 210, Extra	Each	.18

PAUL

CODE: ASVORMIG

FOR DRIP OR VACUUM AIR LINE SERVICE

These Valves have 1/8 inch Nipple connection for Radiator and 1/4 inch Union connection.

Price	Each	1.25

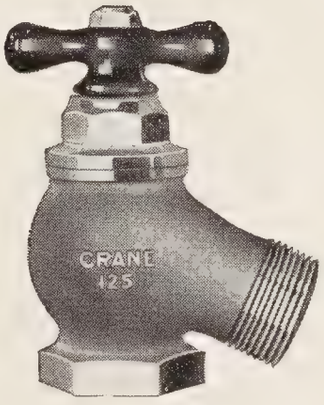
HOSE VALVES

BRASS WITH LEATHER DISC

No. 56
GARDEN HOSE
CODE: ATBARA

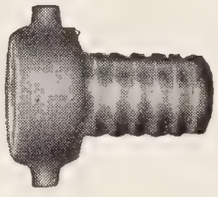
No. 58
GARDEN HOSE
CODE: ATHABASCA

No. 50. IRON HANDLE
OUTSIDE STAND PIPE
CODE: ATHEMKRAFT
No. 52. FINISHED
BRASS WHEEL
CODE: ATHYMBRA



No. 59
COKE OVEN

CODE: ATILIANUS



HOSE CONNECTION
FOR 1-INCH HOSE

CODE: ATINCONADO

Size.....Inches	½	¾	1	1¼	1½	2	2½
Size.....Millimeters	13	19	25	32	38	50	64
Price, No. 56.....Each	1.65	1.65	2.20	3.40	4.75	7.00	15.00
Price, No. 58.....Each	1.65	1.65	2.20	3.40	4.75	7.00	15.00
Price, No. 50, Rough Body, Plain...Each			3.15	3.70	4.75	7.00	8.50
Price, No. 50, Rough Body, Plated all over .....Each			3.65	4.30	5.50	8.00	9.75
Price, No. 52, Finished all over.....Each					9.00	11.50	14.50
Price, No. 52, Finished and Plated all over .....Each					10.00	12.75	16.00
Price, No. 59, without Hose Connection .....Each			1.50				
Hose Connection, Extra.....Each			.40				

No. 52 Valves are made to order only.

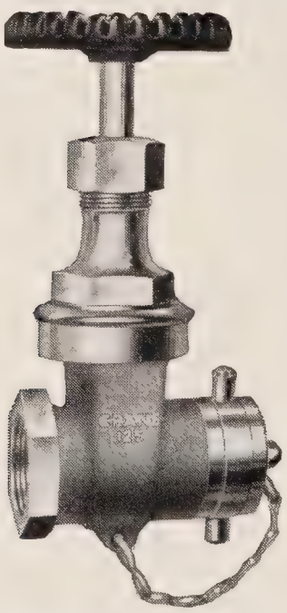
Nos. 50 and 52 Valves have more clearance than the Nos. 56 and 58 Garden Hose Valves.

The Nos. 50, 52, 56 and 58 Valves will be furnished with Chicago hose thread on sizes 2-inch and smaller, and Chicago Fire Department hose thread on the 2½-inch size, or they will be furnished with California hose thread or iron pipe thread on all sizes, at regular prices. Any other style thread will be extra. In ordering, always specify the thread required.

The hose end of the No. 59 Valve has an adopted thread. If any special thread is required, it will be necessary to send us a sample thread, preferably the male end of a hose coupling. An extra charge will be made for special threads.

We will make to order 1¼-inch, No. 59 Valves, at a special price, according to quantity wanted.

STANDARD
HOSE GATE VALVES
BRASS
DOUBLE DISC TAPER SEATS RISING STEM
FOR WATER WORKING PRESSURES UP TO 175 POUNDS
FOR STEAM WORKING PRESSURES UP TO 125 POUNDS



No. 450. IRON WHEEL, WITH BRASS CAP AND CHAIN
CODE: ATISBABAN

Size....Inches	1	1¼	1½	2	2½	3
Size....Millimeters	25	32	38	50	64	76
Rough Body, Plain, with Brass Cap and Chain....Each	5.10	6.70	8.85	12.60	20.00	29.50
Rough Body, Plain, without Cap and Chain....Each	3.35	4.70	6.25	9.00	15.00	22.00

No. 452. WITH FINISHED BRASS WHEEL

Size....Inches	1	1¼	1½	2	2½	3
Size....Millimeters	25	32	38	50	64	76
Finished all over, with Brass Cap and Chain....Each	8.65	11.10	14.45	20.90	31.00	45.50
Finished all over, without Cap and Chain....Each	6.90	9.10	11.85	17.30	26.00	38.00
Finished and Plated all over, with Brass Cap and Chain....Each	9.25	11.80	15.25	21.90	32.25	47.25
Finished and Plated all over, without Cap and Chain....Each	7.50	9.80	12.65	18.30	27.25	39.75

These Valves have standard pipe threads on Female end and hose thread on Male end.

These Valves will be furnished with Chicago hose thread on sizes 2-inch and smaller, also the 3-inch; and Chicago Fire Department hose thread on the 2½-inch size, or they will be furnished with California hose thread or iron pipe thread on all sizes, at regular prices.

The 2½ and 3-inch sizes can also be furnished with National Standard hose thread when so ordered.

If any other thread is required, it will be necessary to send us a sample thread, preferably the Male end of a hose coupling.

In ordering, always specify the thread required.

These Valves are made to order only. Not regularly carried in stock.

UNDERWRITERS' STANDARD

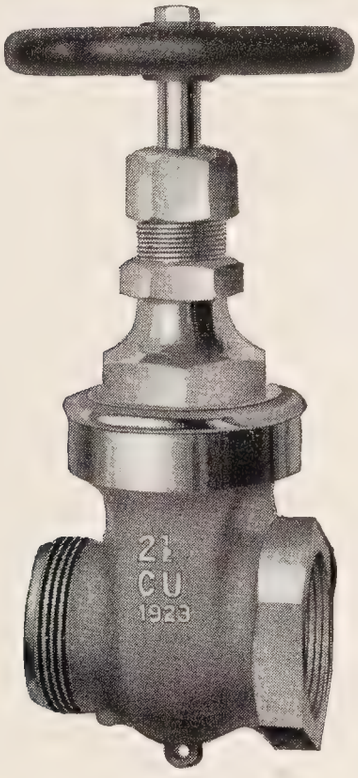
HOSE GATE VALVES

BRASS

WITH A GLAND IN THE STUFFING BOX — WEDGE DISC

SPECIAL INDICATOR WHEEL — NON-RISING STEM

FOR WATER WORKING PRESSURES UP TO 150 POUNDS



No. 453

CODE: ATRABANCO

Size	Inches	1½	2½
Size	Millimeters	38	64
Price, Screwed	Each	9.00	19.00
Price, with Drain Cock	Each	10.00	20.00

These Valves are designed in accordance with the rules and requirements of the National Fire Protection Association.

They are marked "CU" to denote their use for fire protection service.

The 2½-inch size is suitable for use on Underwriters' fire pumps and hydrants.

Either size may be used on risers for hose connections.

These Valves have standard pipe threads on female end and hose thread on male end.

These Valves will be furnished with Chicago hose thread on the 1½-inch size, and Chicago Fire Department hose thread on the 2½-inch size, or they will be furnished with California hose thread or iron pipe thread on all sizes, at regular prices.

The 2½-inch size can be furnished with National Standard Hose Threads in accordance with the Underwriters' rules when so ordered.

If any other hose thread is desired, it will be necessary to send us a sample thread, preferably the male end of a hose coupling.

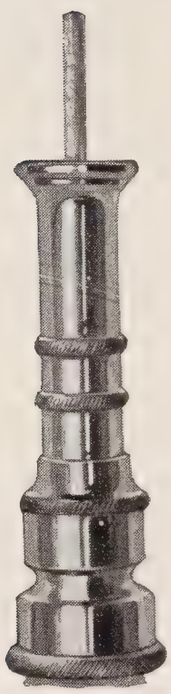
These Valves will be furnished with a pet cock for draining the outlet side, when so ordered.

THE GENUINE GEM

BRASS HOSE NOZZLES

PATENTED

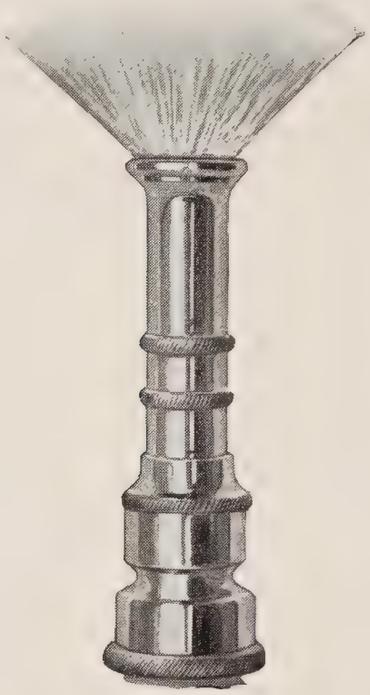
EASILY ADJUSTED



STREAM

No. 904

CODE: ATRAMPAD

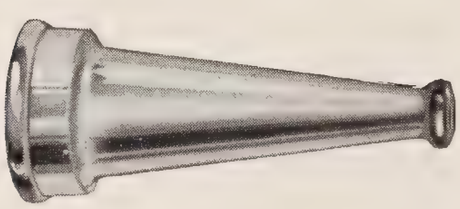


SPRAY

FREE FROM LEAKAGE

FEMALE HOSE THREAD

Size	Inches	¾
Size	Millimeters	19
Price	Per dozen	10.00



No. 906. FEMALE THREAD

CODE: ATRANCADOS

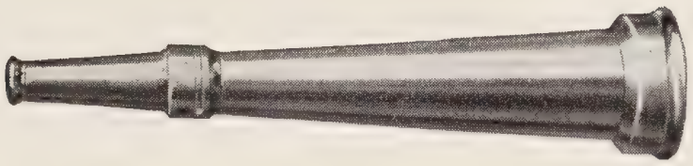
No. 908

CODE: ATROPELAVA

Size	Inches	¾	¾	1	1¼	1¼	1½
Size	Millimeters	19	19	25	32	32	38
Length to Screw	Inches	3	8	4	4¾	12	5¾
Length to Wind	Inches	5½		6			
No. 906, Hose Pipe Thread	Per dozen	4.00	7.00	5.00	12.00	18.00	18.00
No. 906, Iron Pipe Thread	Per dozen	5.00	8.00	6.25	13.75	19.75	19.75
No. 908, to Wind	Per dozen	4.00		9.50			
Size	Inches	1½	2	2	2½	2½	2½
Size	Millimeters	38	50	50	64	64	64
Length to Screw	Inches	12	6¾	12	7½	12	22
No. 906, Hose Pipe Thread	Per dozen	22.00	26.00	34.00	37.40	55.00	92.00
No. 906, Iron Pipe Thread	Per dozen	24.00	29.00	39.00	39.50	60.00	120.00

BRASS HOSE PIPES

SCREW TIPS



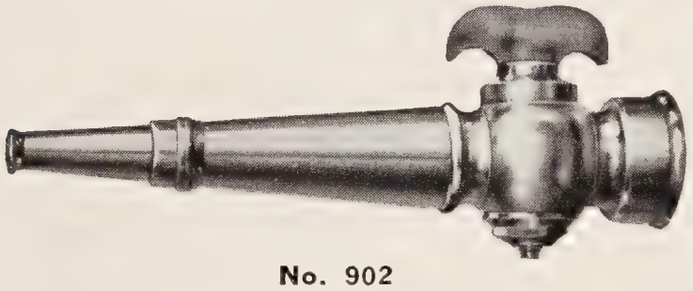
No. 900

CODE: AUBAINAGE

Size.....Inches	¾	¾	¾	1	1	1¼
Size.....Millimeters	19	19	19	25	25	32
Length.....Inches	6	7½	12	8½	12½	12
Hose or Iron Pipe Thread..Per dozen	7.00	8.00	10.00	10.00	12.00	20.00
Size.....Inches	1¼	1½	1½	1½	1½	2
Size.....Millimeters	32	38	38	38	38	50
Length.....Inches	15	12	13	15	19	12
Hose or Iron Pipe Thread..Per dozen	24.00	24.00	25.00	30.00	40.00	38.00
Size.....Inches	2	2	2½	2½	2½	2½
Size.....Millimeters	50	50	64	64	64	64
Length.....Inches	15	20	15	20	24	30
Hose or Iron Pipe Thread..Per dozen	45.00	50.00	75.00	96.00	100.00	144.00

BRASS HOSE PIPES

WITH COCK



No. 902

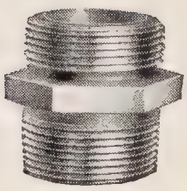
CODE: AUFBRUCHES

Size.....Inches	¾	¾	¾	1	1	1¼
Size.....Millimeters	19	19	19	25	25	32
Length.....Inches	6	8	12	8	12	12
Hose or Iron Pipe Thread..Per dozen	11.00	13.00	18.00	15.00	20.00	40.00
Size.....Inches	1¼	1½	1½	2	2	2
Size.....Millimeters	32	38	38	50	50	50
Length.....Inches	15	12	15	12	20	25
Hose or Iron Pipe Thread..Per dozen	50.00	55.00	65.00	80.00	110.00	130.00
Size.....Inches	2½	2½	2½	2½		
Size.....Millimeters	64	64	64	64		
Length.....Inches	12	15	20	24		
Hose or Iron Pipe Thread..Per dozen	145.00	155.00	160.00	175.00		

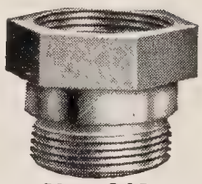
When ordering, always specify whether Hose or Iron Pipe Thread is wanted.

BRASS HOSE FITTINGS

HOSE NIPPLES



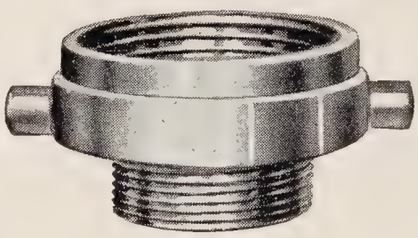
No. 940
MALE
CODE: AUFGERAFFT



No. 942
MALE AND FEMALE
CODE: AUFJUBEL

Size.....Inches	½	¾	1	1¼	1½	2	2½	3	3½	4
Size.....Millimeters	13	19	25	32	38	50	64	76	90	100
Male.....Per dozen	3.50	3.50	5.00	9.00	10.00	14.00	28.00	40.00	50.00	75.00
Male and Female.....Per dozen	3.50	3.50	5.00	9.00	10.00	14.00	28.00	40.00	50.00	75.00

HOSE REDUCERS

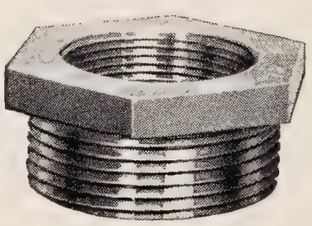


No. 944
CODE: AUFPAUKEN

Size.....Inches	1x¾	1¼x¾	1¼x1	1½x¾	1½x1	1½x1¼	2x¾	2x1	2x1¼
Size.....Millimeters	25x19	32x19	32x25	38x19	38x25	38x32	50x19	50x25	50x32
Price.....Per dozen	6.50	8.00	10.00	11.50	11.50	12.00	13.00	14.00	16.00

Size.....Inches	2x1½	2½x¾	2½x1	2½x1¼	2½x1½	2½x2	3x2	3x2½
Size.....Millimeters	50x38	64x19	64x25	64x32	64x38	64x50	76x50	76x64
Price.....Per dozen	18.00	20.00	22.00	23.00	24.00	26.00	30.00	36.00

HOSE BUSHINGS



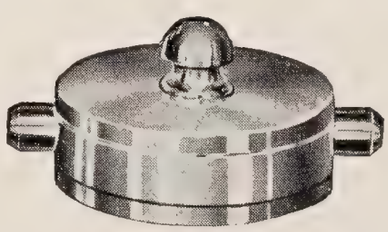
No. 946
CODE: AUFSICHTIG

Size.....Inches	1x¾	1¼x¾	1¼x1	1½x¾	1½x1	1½x1¼	2x¾	2x1	2x1¼
Size.....Millimeters	25x19	32x19	32x25	38x19	38x25	38x32	50x19	50x25	50x32
Price.....Per dozen	6.50	8.00	10.00	11.50	11.50	12.00	13.00	14.00	16.00

Size.....Inches	2x1½	2½x¾	2½x1	2½x1¼	2½x1½	2½x2	3x2	3x2½
Size.....Millimeters	50x38	64x19	64x25	64x32	64x38	64x50	76x50	76x64
Price.....Per dozen	18.00	20.00	22.00	23.00	24.00	26.00	30.00	36.00

In ordering any of the above goods, specify whether Hose or Iron Pipe Thread is required.

HOSE CAPS

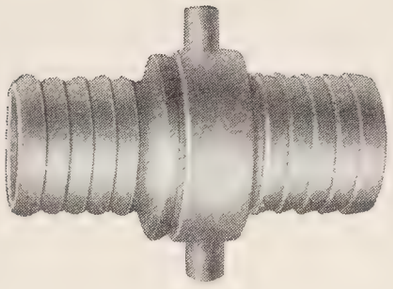


No. 948
CODE: AUFUGERUNT

Size.....Inches	¾	1	1¼	1½	2	2½	3	3½	4
Size.....Millimeters	19	25	32	38	50	64	76	90	100
Price.....Per dozen	4.00	6.00	8.00	10.00	15.00	24.00	31.00	39.00	43.00

Sample of Hose Thread required, preferably the Male end of a hose coupling, must be furnished with order.

BRASS HOSE COUPLINGS



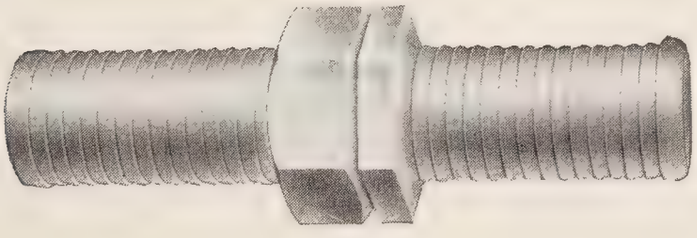
NO. 920

CODE: AULIFANTE

Size.....Inches	½	¾	1	1¼	1½	2	2½	3
Size.....Millimeters	13	19	25	32	38	50	64	76
Hose Pipe or Iron Pipe Thread.....Per Dozen	2.40	2.40	4.40	10.00	14.00	24.00	48.00	75.00

In ordering, specify style of Thread.

BRASS STEAM HOSE COUPLINGS



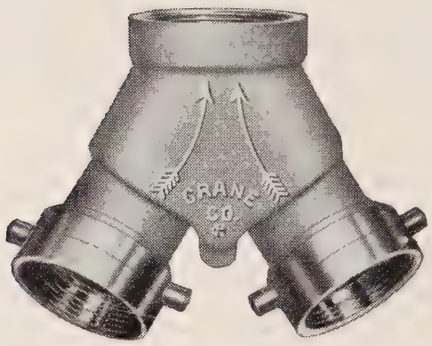
NO. 924

CODE: AUMONAMES

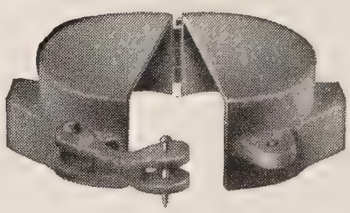
Size.....Inches	½	¾	1	1¼	1½	2	2½
Size.....Millimeters	13	19	25	32	38	50	64
Price.....Per Dozen	15.00	15.00	18.00	24.00	30.00	42.00	72.00

BRASS SIAMESE CONNECTION

FOR STAND PIPES



No. 950
CODE: AURULARUM



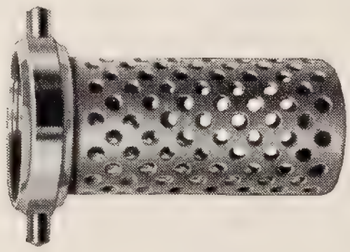
MORSE CAP
CAST IRON
CODE: AUSANDERST

Size, Iron Pipe	Inches	3	4
Size	Millimeters	76	100
Size, Both Nozzles	Inches	2½	2½
Price, Siamese Connection	Each	15.00	18.00
Price, Morse Cap, Extra	Each	1.50	1.50

The Hose Connections are threaded Chicago Fire Department Standard. Can furnish any thread desired upon receipt of sample.

Morse Caps for Fehy Connections and 3 inch Morse Caps for New York Fittings can also be furnished. Prices on application.

BRASS SUCTION HOSE STRAINERS



No. 952
CODE: AUSDARMEND

Size	Inches	2	2½	3	4	5	6
Size	Millimeters	50	64	76	100	125	150
Price	Each	7.50	8.50	10.00	19.00	31.00	46.00

In ordering, specify whether Hose, or Iron Pipe Thread is required.

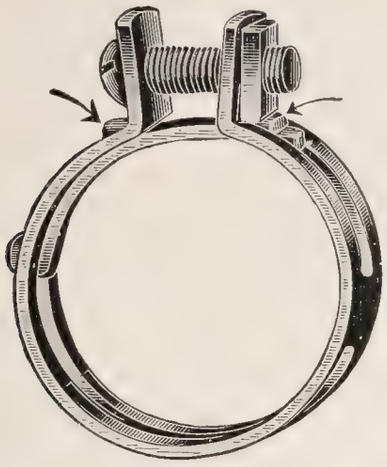
HOSE SPANNERS

No. 954
MALLEABLE IRON
CODE: AUSGOFFERN

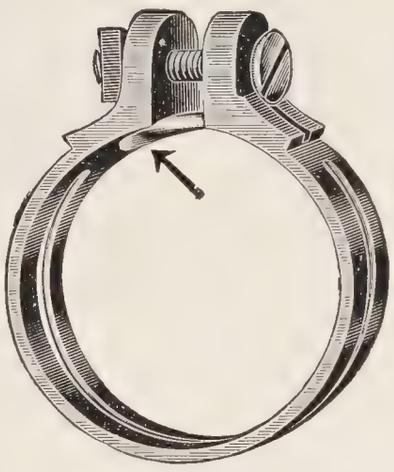
Size	Inches	1¼	1½	2	2½
Size	Millimeters	32	38	50	64
Price	Each	.12	.15	.20	.25

HOSE CLAMPS

IMPROVED HOSE CLAMPS
MADE OF GALVANIZED STEEL
POSITIVE GRIP, STRONG AND DURABLE



BRASS HOSE CLAMPS
CAST BRASS



No. 927 GALVANIZED STEEL CLAMPS FOR WATER HOSE

CODE: AUSOPFERST

Size Hose Inches	Ply of Hose	Inside Diameter of Clamp when Open ½ to ¾ inch Between Ears	Price Per Dozen	Number of Dozen in a Box
½	3, 4, and 5	¾ to 1	1.50	12
¾	2, 3, 4 and 5	1 1/16 to 1 ¼	1.50	12
1	3 and 4	1 ⅜ to 1 7/16	2.00	6
1 ¼	3 and 4	1 1/16 to 1 13/16	2.50	3
1 ½	3 and 4	2 to 2 ⅛	3.00	3
2	3 and 4	2 ½ to 2 ⅝	4.00	2
2 ½	3, 4 and 5	3 to 3 ⅛	7.00	1
3	3, 4, 5 and 6	3 7/16 to 3 ¾	10.00	1
2″ Suc. Hse.	4	3	10.00	1

No. 929 GALVANIZED STEEL CLAMPS FOR STEAM HOSE

CODE: AVIGORANSE

Size Hose Inches	Ply of Hose	Inside Diameter of Clamp when Open ¾ Inch Between Ears	Price Per Dozen	Number of Dozen in a Box
¾	4 and 5	1 ⅜ to 1 ½	2.00	12
1	4, 5 and 6	1 11/16 to 1 13/16	2.50	12
1 ¼	4, 5 and 6	1 15/16 to 2 1/16	3.00	3
1 ½	4, 5 and 6	2 ¼ to 2 ⅜	3.50	3
2	4, 5 and 6	2 11/16 to 2 ⅞	5.50	2
2 ½	4, 5 and 6	3 to 3 ⅛	8.50	1

No. 931 BRASS HOSE CLAMPS FOR WATER HOSE

CODE: AVITELADAS

Size ..... Inches	½	¾	1	1 ¼	1 ½	2	2 ½	3
Price, 3 and 4 Ply ..... Per Dozen	1.50	1.50	2.00	2.50	3.00	4.00	7.00	10.00

No. 932 BRASS HOSE CLAMPS FOR STEAM HOSE

CODE: AVOCHIAMO

Size and ply of Hose	¾″–4	1″–4	1 ¼″–4	1 ½″–4
Inside Diameter, open	1 17/32	1 21/32	1 31/32	2 7/32
List Price ..... Per Dozen	2.00	2.50	3.00	3.50
Size and ply of Hose	1 ½″–5	2″–4	2″–5	2 ½″–4
Inside Diameter, open	2 13/32	2 11/16	2 14/16	3 ¼
List Price ..... Per Dozen	4.00	5.50	6.50	8.50

Larger size Clamps, prices on application.
In ordering, always specify the size and ply of hose.

MACHINE MADE WATER HOSE

CODE: AVOLUMADA

Internal Diameter Inches	2-Ply Per Ft.	3-Ply Per Ft.	4-Ply Per Ft.	5-Ply Per Ft.	6-Ply Per Ft.
½	.20	.25	.30	.37	.45
¾	.25	.30	.37	.46	.55
1	.33	.40	.50	.62	.75
1 ¼	.42	.50	.62	.77	.93
1 ½	.50	.60	.75	.93	1.12
1 ¾	.58	.70	.87	1.08	1.30
2	.66	.80	1.00	1.25	1.50
2 ¼	.75	.90	1.12	1.40	1.68
2 ½	.83	1.00	1.25	1.56	1.87

Larger sizes, prices on application.

MOULDED BRAIDED WATER HOSE

CODE: AVROLLO

Internal Diameter Inches	Double Fabric Per Foot	Triple Fabric Per Foot	Quadruple Fabric Per Foot
½	.25	.30	.37
⅝	.28	.34	.42
¾	.30	.37	.46
1	.40	.50	.62
1 ¼	.50	.62	.77
1 ½	.60	.75	.93

For larger sizes use machine made ply hose list above.

GARDEN HOSE

CODE: AVVEDESSE

Moulded (Braided Construction) and Ply (Wrapped Construction). ½, ⅝ and ¾-inch, see lists above covering water hose.

STEAM HOSE

CODE: AVVIANDOSI

Internal Diameter Inches	3-Ply Per Foot	4-Ply Per Foot	5-Ply Per Foot	6-Ply Per Foot	8-Ply Per Foot
¼	.35	.38	.47	.56	
⅜	.38	.47	.56	.70	
½	.47	.56	.70	.84	
¾	.57	.71	.87	1.05	1.41
1	.70	.87	1.07	1.28	1.70
1 ¼	.85	1.04	1.30	1.56	2.08
1 ½	1.02	1.25	1.56	1.87	2.50
1 ¾	1.18	1.45	1.81	2.17	2.90
2	1.34	1.66	2.07	2.49	3.32

HYDRANT CLAMPS

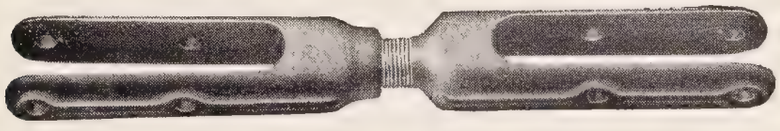
MALLEABLE IRON

NO. 850

CODE: AWEBAND

Size of Cock to be used with.....Inches	½	⅝	¾	1	1¼
Size of Cock to be used with.....Millimeters	13	16	19	25	32
No. 850, Mall. Iron, with ⅜ inch square hole...Per Lb.	.15	.15	.15		
No. 850, Mall. Iron, with 7/16 inch square hole...Per Lb.	.15	.15	.15	.15	.15
No. 850, Mall. Iron, with ½ inch square hole...Per Lb.	.15	.15	.15	.15	.15
No. 850, Mall. Iron, tapped for ⅜ inch pipe....Per Lb.	.18	.18	.18	.18	.18
No. 850, Mall. Iron, tapped for ⅜ in. pipe, Galv.Per Lb.	.25	.25	.25	.25	.25
No. 850, Mall. Iron, tapped for ½ inch pipe....Per Lb.	.20	.20	.20	.20	.20

WOOD ROD COUPLINGS



NO. 854. MALLEABLE IRON

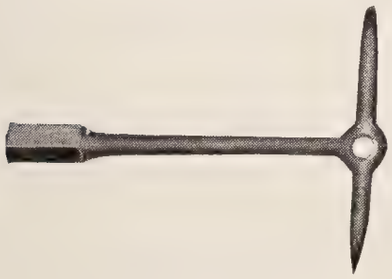
CODE: BABACTES

These couplings have ⅜ inch pipe thread and may be used with 1 or 1⅛ inch square rod.

Price, Plain.....Per Set	.40
Price, Galvanized.....Per Set	.50

STREET WASHER KEYS

MALLEABLE IRON



NO. 856

CODE: BABATAMBI

To fit ⅜ inch Square Rod.
To fit ½ inch Square Rod.

LENGTH 8¾ INCHES

Price.....Per Pound	.15

HYDRANT HANDLES

MALLEABLE IRON

NO. 858

CODE: BABELIQUE

With ⅜ inch Pipe Thread.

NO. 860

CODE: BABILLAGE

To fit ⅜ inch Square Rod.

Price, No. 858.Per Pound	.20
Price, No. 860.Per Pound	.15

BRASS FITTINGS, UNIONS, NIPPLES, ETC.

PAGES 77 TO 88

SHOW OUR

REGULAR LINE OF

BRASS NIPPLES, FITTINGS, ETC.

THESE GOODS ARE MADE OF

CRANE SPECIAL BRASS

AND ARE FOR

MARINE SERVICE

AND

COMMERCIAL USES

BRASS STEAM FITTINGS

IRON PIPE SIZE

ROUGH

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS

ELBOW

CODE: BACHALATO

45° ELBOW

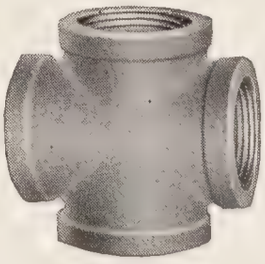
CODE: BACLAGE

TEE

CODE: BAFAM

Y BEND

CODE: BAJULETUR



CROSS

CODE: BAGAJILLO

Size.....In.	1/8	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4
Size..... Millimeters	3	6	10	13	19	25	32	38	50	64	76	90	100
Elbows.....Each	.12	.15	.20	.28	.40	.63	.90	1.20	2.00	3.50	6.00	8.00	10.00
Elbows, Reducing.....Each	*	.19	.25	.35	.50	.80	1.10	1.50	2.50	4.25	7.50	10.00	12.50
Elbows, 45°.... Each	.16	.20	.25	.31	.40	.63	.90	1.20	2.00	3.50	6.00		10.00
Elbows, Street..Each	.25	.27	.33	.48	.63	.85	1.50	2.00	3.25				
Elbows, Drop, Female.....Each			.35	.45	.65	1.05	1.50	2.00	3.40				
Elbows, Side Outlet.....Each			.60	.85	1.20	1.90	2.75	3.60	6.00	10.50	18.00		
Tees.. .....Each	.17	.21	.28	.40	.55	.85	1.25	1.70	2.80	5.00	8.50	11.00	14.00
Tees, Reducing.Each	*	.25	.35	.50	.70	1.05	1.55	2.10	3.50	6.25	10.50	14.00	17.50
Tees, Drop, Female.....Each			.43	.57	.80	1.25							
Tees, 4-Way....Each				1.20	1.65	2.50	3.75	5.00	8.50				
Crosses.....Each	.25	.30	.40	.55	.80	1.25	1.80	2.40	4.00	7.00	12.00	16.00	20.00
Crosses, Reducing.....Each	*	.38	.50	.70	1.00	1.55	2.25	3.00	5.00	8.75	15.00	20.00	25.00
Bushings.....Each		.10	.12	.15	.22	.35	.50	.70	1.00	1.50	2.50	3.75	5.00
Face Bushings..Each		.12	.15	.19	.27	.44	.62	.87	1.25	1.85	3.10	4.75	6.25
Plugs.....Each	.08	.10	.12	.15	.20	.30	.45	.60	.95	1.50	2.25	3.75	5.00
Solid Plugs.....Each			.18	.22	.30	.45	.80	1.20	1.90	3.00	4.50	7.50	10.00
Countersunk Plugs.....Each				.22	.30	.45	.65	.90	1.40				
Caps.....Each	.10	.13	.16	.20	.30	.42	.60	.80	1.25	2.50	3.50	5.50	7.00
Lock-nuts.....Each	.10	.10	.12	.15	.20	.28	.40	.55	.80	1.75	2.75	4.00	5.00
Reducers.....Each		.15	.20	.28	.40	.60	.90	1.10	1.75	2.75	4.00	6.00	8.00
Couplings.....Each	.10	.13	.17	.25	.37	.55	.80	1.00	1.60	2.50	3.50	5.25	7.00
Couplings, R. & L.....Each		.17	.22	.30	.45	.70	1.00	1.30	2.00	3.10	4.50		
Return Bends, Close.....Each				.70	1.00	1.25	1.80	2.50	4.25				
Center to Center, Close...Inches				1	1 1/4	1 1/2	1 3/4	2 3/16	2 5/8				
Return Bends, Open.....Each				.80	1.10	1.40	2.15	3.00	4.75	8.25	11.00		
Center to Center, Open...Inches				1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5		
Y Bends.....Each				.75	1.10	1.65	2.50	3.30	5.50	9.50	16.00		26.00

For Brass Unions, see pages 84 to 86.

Right and Left Elbows and Right and Left Return Bends will be furnished at an advance of 25% over above listed prices.

*Elbows, Tees, Crosses, Bushings and Reducers, reducing more than two sizes, will be furnished at an advance of 25% over above reducing listed prices.

For dimensions, see page 639.

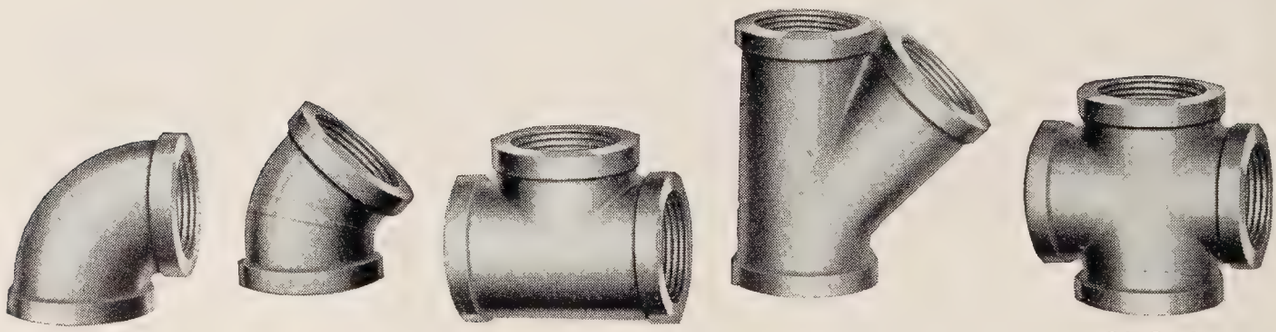
BRASS STEAM FITTINGS

IRON PIPE SIZE

FINISHED

(POLISHED AND BUFFED)

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS



ELBOW — CODE: BALMDEW

45° ELBOW — CODE: BAMBOCHES

TEE — CODE: BAQUEAMOS

Y BEND — CODE: BARSTON

CROSS — CODE: BARBARIDAD

Size.....Inches	1/8	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4
Size..Millimeters	3	6	10	13	19	25	32	38	50	64	76	90	100
Elbows.....Each	.30	.35	.45	.56	.75	1.10	1.55	2.00	3.00	5.50	9.00	14.00	17.50
Elbows, Reducing..Each	*	.44	.55	.70	.95	1.40	1.90	2.50	3.75	6.75	11.25	17.50	22.00
Elbows.,.45° Ea.	.38	.45	.55	.66	.85	1.23	1.70	2.20	3.25	6.00	9.75		19.50
Elbows, Street....Each	.47	.52	.63	.83	1.08	1.45	2.30	3.00	4.50				
Elbows, Drop, Female.Each			.85	1.05	1.40	2.00	2.80	3.60	5.40				
Elbows, Side Outlet..Each			1.35	1.70	2.25	3.30	4.70	6.00	9.00	16.50	27.00		
Tees.,.....Each	.42	.49	.63	.80	1.05	1.50	2.15	2.80	4.20	7.75	12.75	19.50	24.50
Tees, Reducing....Each	*	.60	.77	1.00	1.30	1.85	2.65	3.50	5.25	9.75	15.80	24.50	30.50
Tees, Drop, Female..Each			1.13	1.37	1.80	2.55							
Tees, 4-Way..Each				2.05	2.70	3.90	5.70	7.40	11.50				
Crosses.....Each	.60	.70	.90	1.10	1.50	2.20	3.10	4.00	6.00	11.00	18.00	28.00	35.00
Crosses, Reducing...Each	*	.88	1.10	1.40	1.85	2.75	3.85	5.00	7.50	13.75	22.50	35.00	44.00
Bushings...Each		.22	.27	.35	.47	.70	1.00	1.40	2.00	3.00	4.50	6.25	8.00
Plugs.....Each	.23	.30	.37	.43	.55	.75	1.00	1.30	1.95	3.00	4.25	6.25	8.00
Solid Plugs..Ea.			.43	.50	.65	.90	1.35	1.90	2.90	4.50	6.50	10.00	13.00
Countersunk Plugs..Each				.42	.55	.80	1.15	1.55	2.25				
Caps.....Each	.20	.25	.31	.40	.55	.77	1.10	1.50	2.25	4.00	5.50	8.00	10.00
Lock-nuts..Each	.24	.25	.32	.40	.50	.65	.85	1.10	1.60	3.25	4.75	6.50	8.00
Reducers...Each	*	.35	.45	.56	.75	1.05	1.55	1.90	2.75	4.75	7.00	12.00	15.50
Couplings..Each	.24	.28	.36	.46	.63	.90	1.30	1.60	2.35	4.00	5.75	9.75	12.50
Couplings, R. & L...Each		.37	.47	.58	.80	1.15	1.65	2.10	3.00	5.10	7.50		
Return Bends, Close.Each				1.55	2.05	2.65	3.75	4.90	7.25				
Center to Center, Close.In.				1	1 1/4	1 1/2	1 3/4	2 3/16	2 5/8				
Return Bends, Open.Each				1.65	2.15	2.80	4.10	5.40	7.75	14.25	20.00		
Center to Center, Open.In.				1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5		
Y Bends....Each				1.60	2.15	3.05	4.45	5.70	8.50	15.50	25.00		41.00

For Brass Unions, see pages 84 to 86.

Right and Left Elbows and Right and Left Return Bends will be furnished at an advance of 25% over above listed prices.

*Elbows, Tees, Crosses, Bushings and Reducers, reducing more than two sizes, will be furnished at an advance of 25% over above reducing listed prices.

For dimensions see page 639.

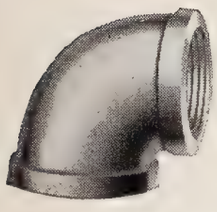
BRASS STEAM FITTINGS

IRON PIPE SIZE

FINISHED AND NICKEL PLATED

(POLISHED AND BUFFED)

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS

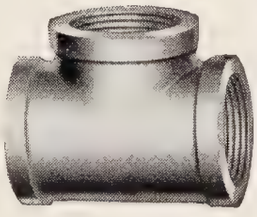


ELBOW

CODE: BASBAQUICE

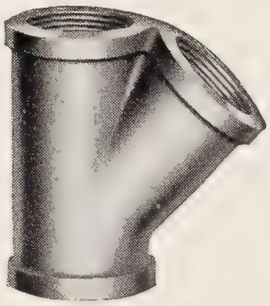
45° ELBOW

CODE: BASTABAMOS



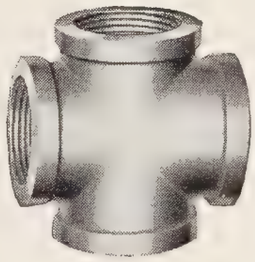
TEE

CODE: BATABOURRE



Y BEND

CODE: BAUERSCHUH



CROSS

CODE: BATHRABBIM

Size.....Inches	⅛	¼	⅜	½	¾	1	1¼	1½	2	2½	3	3½	4
Size..Millimeters	3	6	10	13	19	25	32	38	50	64	76	90	100
Elbows.....Each	.36	.42	.53	.65	.87	1.25	1.75	2.25	3.35	6.15	10.00	16.00	20.00
Elbows, Reducing...Each	*	.52	.65	.82	1.10	1.60	2.15	2.85	4.15	7.60	12.50	20.00	25.00
Elbows, 45° Each	.45	.53	.65	.78	1.00	1.43	1.95	2.55	3.65	6.85	11.00		22.50
Elbows, Street.....Each	.54	.60	.73	.95	1.23	1.65	2.55	3.35	4.90				
Elbows, Drop, Female, Each			1.00	1.25	1.65	2.30	3.20	4.10	6.00				
Elbows, Side Outlet..Each			1.60	2.00	2.60	3.75	5.35	6.80	10.00	18.50	30.00		
Tees.....Each	.50	.58	.75	.93	1.22	1.70	2.45	3.15	4.65	8.65	14.00	22.30	28.00
Tees, Reducing....Each	*	.72	.90	1.15	1.50	2.10	3.00	3.95	5.85	10.90	17.50	28.00	35.00
Tees, Drop, Female..Each			1.33	1.62	2.15	2.95							
Tees, 4-Way, Each				2.35	3.05	4.35	6.35	8.20	12.50				
Crosses.....Each	.72	.84	1.05	1.30	1.75	2.50	3.50	4.50	6.70	12.30	20.00	32.00	40.00
Crosses, Reducing..Each	*	1.05	1.30	1.65	2.15	3.15	4.35	5.70	8.30	15.40	25.00	40.00	50.00
Bushings...Each		.26	.32	.42	.55	.82	1.15	1.65	2.35	3.50	5.15	7.10	9.00
Plugs.....Each	.28	.37	.45	.52	.67	.90	1.20	1.55	2.30	3.50	4.90	7.10	9.00
Solid Plugs..Each			.51	.59	.77	1.05	1.55	2.15	3.25	5.00	7.15	10.85	14.00
Countersunk Plugs..Each				.49	.63	.92	1.30	1.75	2.55				
Caps.....Each	.23	.29	.36	.47	.63	.89	1.25	1.75	2.60	4.50	6.15	8.85	11.00
Lock-nuts..Each	.29	.30	.39	.48	.60	.77	1.00	1.30	1.85	3.75	5.40	7.35	9.00
Reducers...Each		.42	.53	.65	.87	1.20	1.75	2.15	3.10	5.40	8.00	14.00	18.00
Couplings..Each	.29	.33	.42	.53	.72	1.00	1.45	1.80	2.60	4.50	6.50	11.25	14.25
Couplings, R. & L...Each		.44	.55	.67	.92	1.30	1.85	2.35	3.35	5.75	8.50		
Return Bends, Close..Each				1.85	2.40	3.10	4.40	5.70	8.25				
Center to Center, Close.In.				1	1¼	1¼	1¾	2 3/16	2 5/8				
Return Bends, Open..Each				1.95	2.50	3.25	4.75	6.20	8.75	16.25	23.00		
Center to Center, Open In.				1½	2	2½	3	3½	4	4½	5		
Y Bends....Each				1.90	2.50	3.50	5.10	6.50	9.50	17.50	28.00		46.00

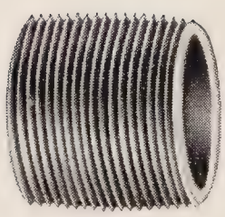
Right and Left Elbows and Right and Left Return Bends will be furnished at an advance of 25% over above listed prices.

*Elbows, Tees, Crosses, Bushings and Reducers, reducing more than two sizes, will be furnished at an advance of 25% over above reducing listed prices.

For dimensions, see page 639.

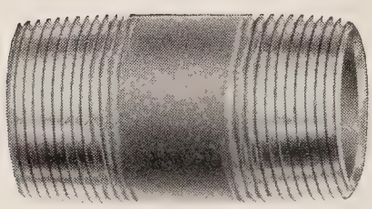
BRASS NIPPLES

IRON PIPE SIZE



CLOSE

CODE: BAUKLOTZ



SHOULDER

CODE: BAUMFORMEN

TABLE OF SIZES AND LENGTHS CARRIED IN STOCK

Size	Size Milli-meters	Length Close *	Close Each	Length, Inches									
				1½	2	2½	3	3½	4	4½	5	5½	6
⅛	3	¾	.11	.13	.15	.17	.19	.21	.23	.25	.27	.29	.31
¼	6	⅞	.13	.16	.19	.22	.25	.28	.31	.34	.37	.40	.43
⅜	10	1	.15	.19	.23	.27	.31	.35	.39	.43	.47	.51	.55
½	13	1⅛	.23	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70
¾	19	1⅜	.28		.35	.42	.49	.56	.63	.70	.77	.84	.91
1	25	1½	.37		.44	.53	.62	.71	.80	.89	.98	1.07	1.16
1¼	32	1⅝	.60			.75	.88	1.01	1.14	1.27	1.40	1.53	1.66
1½	38	1¾	.70			.90	1.05	1.20	1.35	1.50	1.65	1.80	1.95
2	50	2	1.00			1.20	1.40	1.60	1.80	2.00	2.20	2.40	2.60
2½	64	2½	1.70				2.00	2.30	2.60	2.90	3.20	3.50	3.80
3	76	2⅝	2.50				2.90	3.30	3.70	4.10	4.50	4.90	5.30
3½	90	2¾	4.00						5.40	6.00	6.60	7.20	7.80
4	100	2⅞	4.75						6.15	6.85	7.55	8.25	8.95

*These lengths conform to the Manufacturers' Standard.

Finished Brass Nipples, longer than Close, will be furnished at an advance of 25 per cent over above prices.

EXTRA HEAVY BRASS FITTINGS

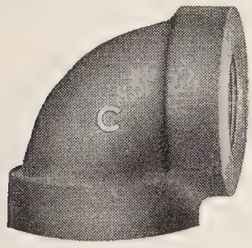
ROUGH

MADE FROM STANDARD CAST IRON PATTERNS

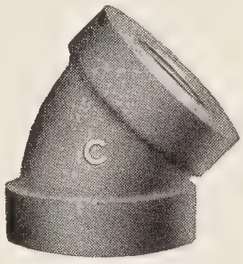
FLAT BAND IRON PIPE SIZE

FOR SATURATED STEAM WORKING PRESSURES UP TO 250 POUNDS

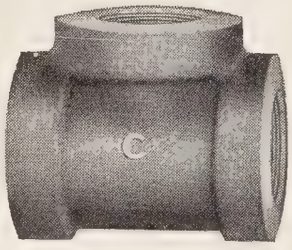
FOR SUPERHEATED STEAM WORKING PRESSURES UP TO 250 POUNDS AND A TOTAL TEMPERATURE NOT EXCEEDING 500 DEGREES FAHRENHEIT



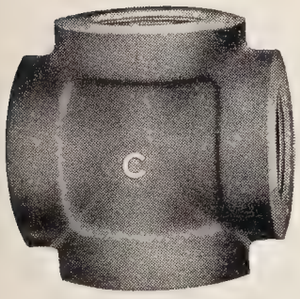
ELBOW
CODE: BEABAMINI



45° ELBOW
CODE: BEDOMPT

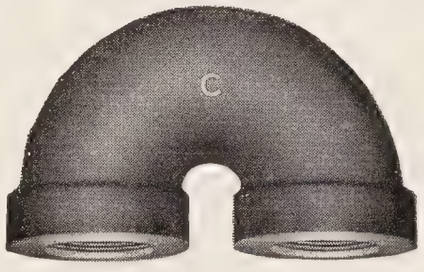


TEE
CODE: BEDROGENEN



CROSS
CODE: BEFABAMOS

Y BEND
CODE: BEGTASHI



RETURN BEND, OPEN
CODE: BEGANGISCH

Size.....Inches	¼	⅜	½	¾	1	1¼	1½	2	2½	3	3½	4
Size.....Millimeters	6	10	13	19	25	32	38	50	64	76	90	100
Elbows.....Each	.33	.45	.65	1.00	1.50	2.25	3.00	4.50	8.00	11.25	16.00	22.00
Elbows, Reducing.....Each	*	.55	.75	1.20	1.80	2.60	3.50	5.25	9.00	13.00	19.00	25.00
Elbows, 45°.....Each		.55	.75	1.10	1.65	2.50	3.25	4.50	8.00	11.25	16.00	22.00
Tees.....Each	.45	.60	.90	1.35	2.00	3.00	4.00	6.00	10.75	15.00	22.00	30.00
Tees, Reducing.....Each	*	.70	1.05	1.55	2.30	3.50	4.50	6.75	12.00	17.00	25.00	35.00
Crosses.....Each			1.30	2.00	3.00	4.50	6.00	9.00	16.00	22.50	28.00	37.00
Crosses, Reducing.....Each	*		1.50	2.40	3.60	5.25	7.00	10.50	18.00	26.00	32.00	42.00
Return Bends, Close.....Each			1.65	2.50	3.50	5.00	7.00	10.00	16.00	22.00		40.00
Center to Center, Close.....Inches			1¼	1½	1¾	2¼	2½	3¼	3¾	4¼		6
Return Bends, Open.....Each				2.75	4.00	5.50	8.00	11.00	18.00	25.00		45.00
Center to Center, Open.....Inches				1⅞	2⅜	3	3½	4½	5½	6½		7½
Y Bends.....Each			1.50	2.50	3.50	5.50	7.25	11.00	19.00	27.00	33.00	45.00
Couplings.....Each	.40	.50	.70	1.10	1.65	2.25	3.00	4.50	7.00	10.00	13.00	17.00
Solid Plugs.....Each		.18	.22	.30	.45	.80	1.20	1.90	3.00	4.50	7.50	10.00

*Elbows, Tees and Crosses, reducing more than two sizes, will be furnished at an advance of 25% over above reducing listed prices.

Fittings can be furnished cast in Brass from any of our Standard or Extra Heavy Cast Iron Patterns. Prices will depend upon the quantity wanted.

Dimensions are same as cast iron, as shown on page 643.

EXTRA HEAVY BRASS FITTINGS

FINISHED

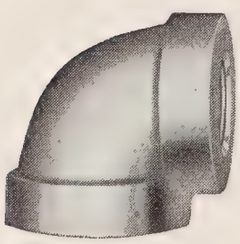
(POLISHED AND BUFFED)

MADE FROM STANDARD CAST IRON PATTERNS

FLAT BAND — IRON PIPE SIZE

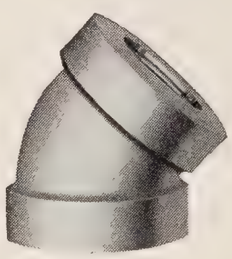
FOR SATURATED STEAM WORKING PRESSURES UP TO 250 POUNDS

FOR SUPERHEATED STEAM WORKING PRESSURES UP TO 250 POUNDS AND A TOTAL TEMPERATURE NOT EXCEEDING 500 DEGREES FAHRENHEIT



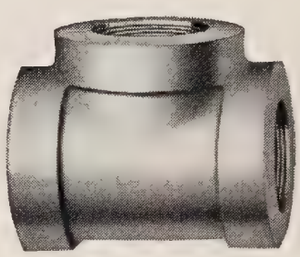
ELBOW

CODE: BEJARANAS



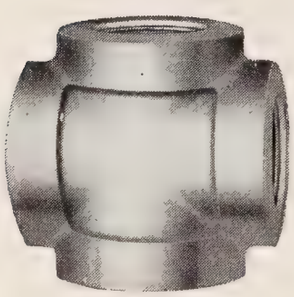
45° ELBOW

CODE: BEKLINKT



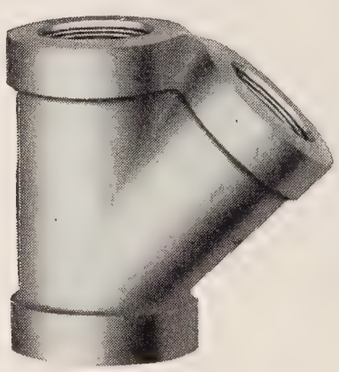
TEE

CODE: BEKNOPTER



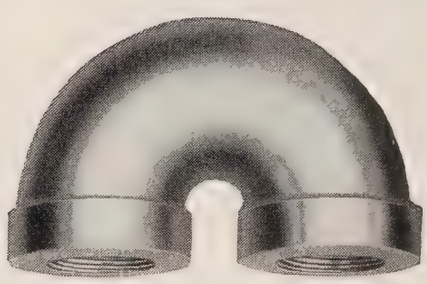
CROSS

CODE: BELOGEN



Y BEND

CODE: BELYTE



RETURN BEND. OPEN

CODE: BELUFTEN

Size.....Inches	¼	⅜	½	¾	1	1¼	1½	2	2½	3	3½	4
Size.....Millimeters	6	10	13	19	25	32	38	50	64	76	90	100
Elbows.....Each	.73	.95	1.25	1.75	2.50	3.50	4.50	6.25	10.50	14.75	23.50	31.00
Elbows, Reducing.....Each	*	1.15	1.50	2.10	3.00	4.10	5.35	7.50	12.00	17.25	28.00	36.00
Elbows, 45° .....Each		1.15	1.50	2.00	2.85	4.00	5.10	6.75	11.00	15.50	25.00	33.00
Tees.....Each	1.00	1.25	1.70	2.35	3.35	4.65	6.00	8.35	14.00	19.75	32.00	42.00
Tees, Reducing.....Each	*	1.50	2.05	2.80	4.00	5.50	7.00	9.75	16.00	23.00	37.00	50.00
Crosses.....Each			2.50	3.50	5.00	7.00	9.00	12.50	21.00	29.50	43.00	55.00
Crosses, Reducing.....Each	*		3.00	4.25	6.00	8.25	10.75	15.00	24.00	35.00	50.00	64.00
Return Bends, Close.....Each			2.85	4.00	5.50	7.50	10.00	13.50	21.00	29.00		58.00
Center to Center, Close.....Inches			1¼	1½	1¾	2¼	2½	3¼	3¾	4¼		6
Return Bends, Open.....Each				4.25	6.00	8.00	11.00	14.50	23.00	32.00		63.00
Center to Center, Open.....Inches				1⅞	2⅜	3	3½	4½	5½	6½		7½
Y Bends.....Each			2.70	4.00	5.50	8.00	10.25	14.50	24.00	34.00	48.00	63.00
Couplings.....Each	.75	.90	1.15	1.70	2.40	3.20	4.15	5.85	9.00	13.00	18.50	24.00
Solid Plugs.....Each		.43	.50	.65	.90	1.35	1.90	2.90	4.50	6.50	10.00	13.00

*Elbows, Tees and Crosses, reducing more than two sizes, will be furnished at an advance of 25 per cent over above Reducing Listed prices.

Fittings can be furnished cast in Brass from any of our Standard or Extra Heavy Cast Iron Patterns. Prices will depend upon the quantity wanted.

Dimensions are same as Cast Iron shown on page 643.

BRASS RAILING FITTINGS

BALL PATTERN

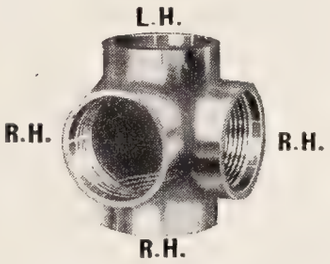
FINISHED BRASS
(POLISHED AND BUFFED)

FOR OFFICE RAILING, ENCLOSING ENGINES AND MACHINERY EXHIBITION SPACES, ETC.

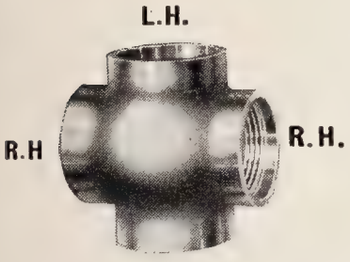
No. 1 BRASS
CODE: BEQUEMLICH

No. 2 BRASS
CODE: BERAUBEN

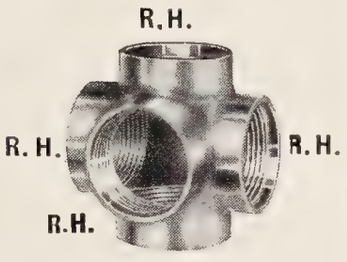
No. 3 BRASS
CODE: BERBENAS



No. 4. BRASS
CODE: BERGACHTIG



No. 5 BRASS
CODE: BERGAMPFER



No. 6 BRASS
CODE: BERGBACH

No. 7 BRASS
CODE: BERGBLAU

No. 8 BRASS
CODE: BERKEBLAD

Pipe Size.....Inches	½	¾	1	1¼	1½	2
Size.....Millimeters	13	19	25	32	38	50
No. 1 Brass, Elbow.....Each	.40	.60	.80	1.20	1.60	2.50
No. 2 Brass, Elbow, Side Outlet.....Each	.75	1.00	1.10	1.70	2.00	3.00
No. 3 Brass, Tee.....Each	.60	.85	1.10	1.70	2.00	3.00
No. 4 Brass, Tee, Side Outlet.....Each	1.05	1.25	1.50	2.00	2.40	3.50
No. 5 Brass, Cross.....Each	1.05	1.25	1.50	2.00	2.40	3.50
No. 6 Brass, Cross, Side Outlet.....Each	1.20	1.45	1.70	2.25	3.00	4.00
No. 7 Brass, Floor Flange, Square.....Each	.75	.90	1.00	1.35	1.75	2.50
No. 8 Brass, Ball Ornament.....Each	.75	.90	1.00	1.35	1.75	2.50

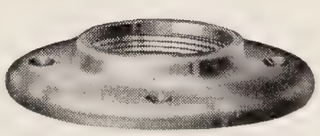
Brass Railing Fittings are made to order only.

Railing Fittings will be furnished tapped, as shown in cuts, or Right Hand on all openings when so specified, at regular price. Tapped otherwise will be charged at 15 per cent. additional net. Orders for fittings to be tapped special should be accompanied by a sketch.

In ordering, specify catalogue number and size.

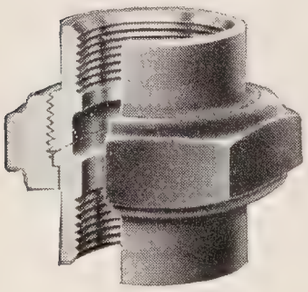
FOR MALLEABLE IRON RAILING FITTINGS, SEE PAGES 341 TO 349.

BRASS ROUND FLOOR FLANGES



CODE: BERLIMOST

Size.....Inches	⅜x2¾	½x3	¾x3¼	1x3⅝	1¼x4	1½x4⅜	2x5
Price, Finished.....Each	1.06	1.24	1.50	2.00	2.34	3.00	3.60



NO. 521½
ROUGH
CODE: BERMELLON

BRASS UNIONS

GROUND JOINT — NO GASKET REQUIRED

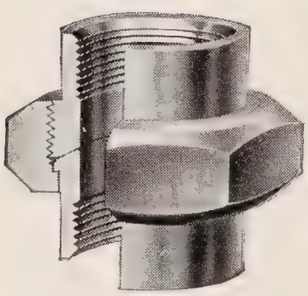
FOR STEAM WORKING PRESSURES UP TO 150 POUNDS

Size.....Inches	¼	⅜	½	¾	1	1¼	1½	2	*2½	*3
Size.....Millimeters	6	10	13	19	25	32	38	50	64	76
No. 521½, Rough.....Each	.50	.65	.85	1.15	1.60	2.25	2.70	4.00	7.50	11.50

*Made to order only.

FOR STEAM WORKING PRESSURES

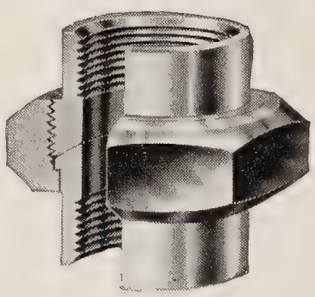
SIZES 3 INCH AND SMALLER, UP TO 200 POUNDS
SIZES 3½ INCH AND 4 INCH, UP TO 125 POUNDS



NO. 522
SEMI-FINISHED
CODE: BESCHIK

Unless otherwise specified, No. 522 Semi-Finished Unions will always be furnished.

THE No. 523 FINISHED UNION IS POLISHED AND BUFFED

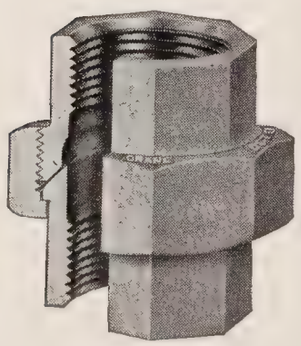


NO. 523
FINISHED
CODE: BESCHULDEN

Size.....Inches	⅛	¼	⅜	½	¾	1	1¼
Size.....Millimeters	3	6	10	13	19	25	32
No. 522, Semi-Finished.....Each	.45	.55	.75	.95	1.30	1.75	2.50
No. 523, Finished.....Each	.50	.60	.85	1.05	1.40	1.90	2.75

Size.....Inches	1½	2	*2½	*3	*3½	*4	
Size.....Millimeters	38	50	64	76	90	100	
No. 522, Semi-Finished.....Each	3.00	4.50	8.25	12.75	22.50	30.00	
No. 523, Finished.....Each	3.25	5.00	9.00	14.00	25.00	33.00	

*Made to order only.



NO. 523½
OCTAGON ENDS
GOVT. PATTERN ROUGH
CODE: BESEBLER

FOR STEAM WORKING PRESSURES UP TO 200 POUNDS

Size.....Inches	¼	⅜	½	¾	1
Size.....Millimeters	6	10	13	19	25
No. 523½, Rough.....Each	.65	.85	1.10	1.50	2.00
Size.....Inches	1¼	1½	2	*2½	*3
Size.....Millimeters	32	38	50	64	76
No. 523½, Rough.....Each	2.80	3.60	5.25	9.00	14.00

*Made to order only.

No. 523½ Unions comply with U. S. Navy specifications in design and material.

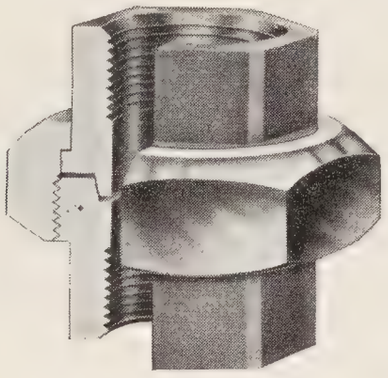
BRASS UNIONS

EXTRA HEAVY

FOR SATURATED STEAM WORKING PRESSURES UP TO 250 POUNDS
FOR SUPERHEATED STEAM WORKING PRESSURES UP TO 250 POUNDS WITH A TOTAL TEMPERATURE NOT TO EXCEED 500° FAHR.
CRANE SPECIAL BRASS

GROUND TAPER JOINT

NO GASKET REQUIRED



RING FINISHED

HEXAGON TAIL PIECES ROUGH

No. 96 E
CODE: BESENMANN

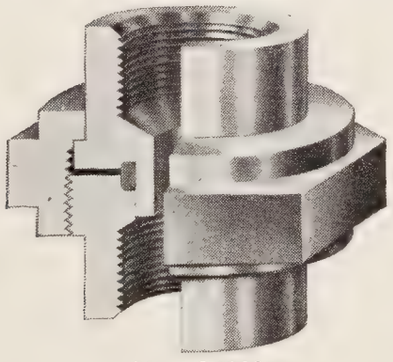
Size.....Inches	¼	⅜	½	¾	1
Size.....Millimeters	6	9	13	19	25
No. 96E.....Each	1.10	1.40	1.60	1.85	3.00
Size.....Inches	1¼	1½	2	*2½	*3
Size.....Millimeters	32	38	50	64	76
No. 96 E.....Each	4.00	5.25	7.50	10.00	15.00

*Made to order only.

HYDRAULIC BRASS UNIONS

FOR COLD WATER OR OIL WORKING PRESSURES AS FOLLOWS:
¼-INCH TO 1¼-INCH, 2000 POUNDS HYDROSTATIC
1½-INCH AND 2 -INCH, 1500 POUNDS HYDROSTATIC
2½-INCH AND 3 -INCH, 1000 POUNDS HYDROSTATIC
CRANE SPECIAL BRASS

FINISHED ALL OVER (POLISHED AND BUFFED)



FITTED WITH COPPER GASKET

No. 240H
CODE: BESHROW

Size.....Inches	¼	⅜	½	¾	1
Size.....Millimeters	6	9	13	19	25
No. 240 H.....Each	1.25	1.50	2.00	3.00	4.00
Size.....Inches	1¼	1½	2	*2½	*3
Size.....Millimeters	32	38	50	64	76
No. 240 H.....Each	5.00	7.00	10.00	12.00	15.00

*Made to order only.

WORKING PRESSURES

No. 240 H Unions are suitable for the working pressure specified above when used in hydraulic installations in which shock is absent or so slight as to be negligible. WHEN SUBJECT TO SHOCK they are NOT recommended for these pressures. See explanatory notes on page 175.

AIR OR GAS

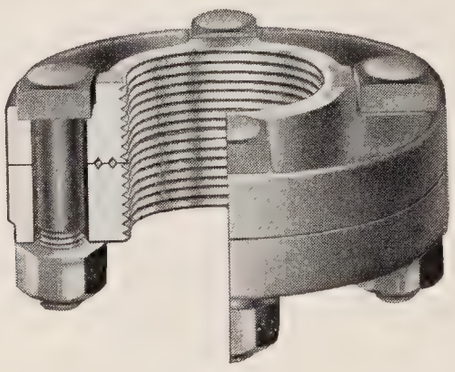
Unions for Air or Gas are SPECIAL. See explanatory notes on page 175.

BRASS FLANGE UNIONS

STANDARD

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS

FACED — GASKET EXTRA



ROUGH

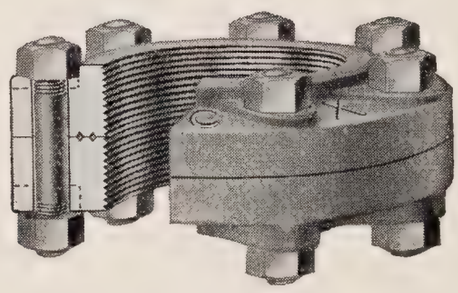
CODE: BESLAGBIJL

Size ... Inches	½	¾	1	1¼	1½	2
Size ... Millimeters	13	19	25	32	38	50
Price ... Each	4.00	4.50	5.00	5.50	7.00	9.00
Diameter Flanges ... Inches	2 13/16	2 7/8	3¼	3¾	4 5/8	5½
No. of Bolts	3	3	4	4	4	4
Size ... Inches	2½	3	3½	4	5	6
Size ... Millimeters	64	76	90	100	125	150
Price ... Each	11.50	15.00	18.00	22.00	35.00	45.00
Diameter Flanges ... Inches	6	6¾	7½	8	9 3/8	10 5/8
Number of Bolts	4	4	4	5	5	6

EXTRA HEAVY

FOR STEAM WORKING PRESSURES UP TO 250 POUNDS

FACED — GASKET EXTRA



ROUGH

CODE: BESLUITING

Size ... Inches	¾	1	1¼	1½	2	2½
Size ... Millimeters	19	25	32	38	50	64
Price ... Each	7.50	8.50	11.00	13.00	16.00	18.00
Diameter Flanges ... Inches	3¼	3 5/8	4 1/8	4 5/8	5 3/8	6
Number of Bolts	4	4	4	4	5	5
Size ... Inches	3	3½	4	4½	5	6
Size ... Millimeters	76	90	100	113	125	150
Price ... Each	24.00	27.00	30.00	37.00	48.00	60.00
Diameter Flanges ... Inches	6¾	7½	8	8¾	9 3/8	10 7/8
Number of Bolts	6	6	7	8	8	9

STANDARD

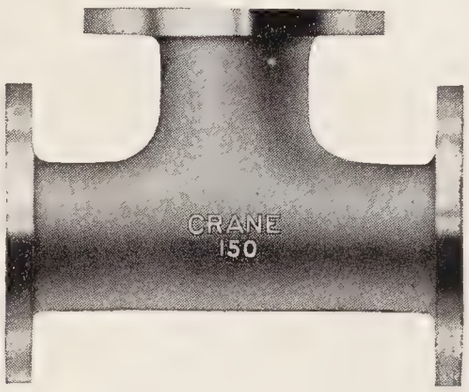
BRASS FLANGED FITTINGS

AND COMPANION FLANGES

FOR STEAM WORKING PRESSURES UP TO 150 POUNDS

FLANGED ELBOWS

CODE: BESPORNEN



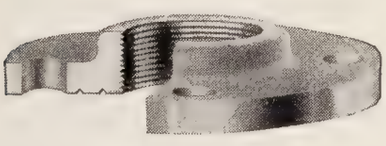
FLANGED TEES

CODE: BESTIALONE

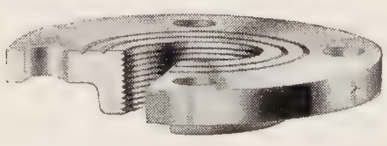
Size Inches	Size Millimeters	Elbows		45° Elbows		Tees		Crosses	
		Faced Each	Faced and Drilled Each	Faced Each	Faced and Drilled Each	Faced Each	Faced and Drilled Each	Faced Each	Faced and Drilled Each
2	50	25.00	26.00	27.50	28.50	37.50	39.00	50.00	52.00
2½	64	33.75	35.00	37.25	38.50	50.75	52.50	67.50	70.00
3	76	43.75	45.00	47.75	49.00	65.75	67.50	87.50	90.00
3½	90	58.75	60.00	63.75	65.00	88.25	90.00	117.50	120.00
4	100	68.00	70.00	73.00	75.00	102.00	105.00	136.00	140.00
4½	113	78.00	80.00	83.00	85.00	117.00	120.00	156.00	160.00
5	125	93.00	95.00	98.00	100.00	137.00	140.00	186.00	190.00
6	150	123.00	125.00	133.00	135.00	187.00	190.00	246.00	250.00

Reducing Brass Flanged Fittings made to order. Prices on application.

COMPANION FLANGES



BACK VIEW, SHOWING HUB



VIEW SHOWING FACE

CODE: BESYNGETI

Size.....Inches	1	1¼	1½	2	2½	3	3½	4	4½	5	6
SizeMillimeters	25	32	38	50	64	76	90	100	113	125	150
Diam. of Flange	4	4½	5	6	7	7½	8½	9	9¼	10	11
Faced....Each	5.75	6.75	8.75	10.75	12.50	15.50	19.25	24.25	26.75	29.00	36.50
Faced & Drilled	6.00	7.00	9.00	11.00	13.00	16.00	20.00	25.00	27.50	30.00	37.50

Standard Brass Flanged Fittings and Companion Flanges are furnished with a plain face scored with shallow "V" grooves inside the bolt holes and the edges of the Flanges are finished.

FOR GENERAL DIMENSIONS, SEE PAGE 651
FOR DRILLING TEMPLATES, SEE PAGE 595

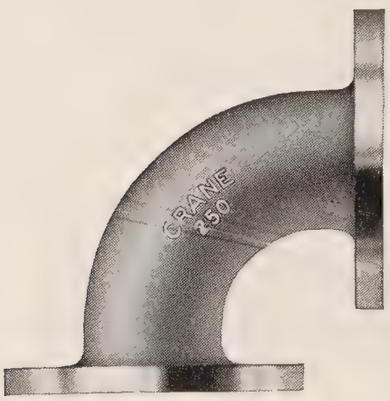
EXTRA HEAVY

BRASS FLANGED FITTINGS

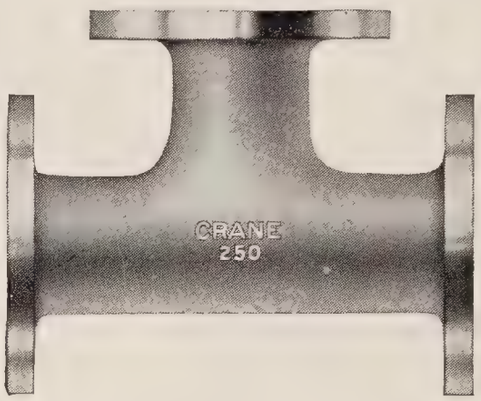
AND COMPANION FLANGES

FOR SATURATED STEAM WORKING PRESSURES UP TO 250 POUNDS

FOR SUPERHEATED STEAM WORKING PRESSURES UP TO 250 POUNDS AND A TOTAL TEMPERATURE NOT EXCEEDING 500 DEGREES FAHRENHEIT



FLANGED ELBOWS
CODE: BETEBAMUS



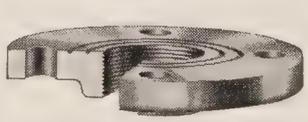
FLANGED TEES
CODE: BETISSABAM

Size In.	Size Millimeters	Elbows		45° Elbows		Tees		Crosses	
		Faced Each	Faced and Drilled Each	Faced Each	Faced and Drilled Each	Faced Each	Faced and Drilled Each	Faced Each	Faced and Drilled Each
1	25	13.00	14.00	14.00	15.00	19.50	21.00	26.00	28.00
1¼	32	15.00	16.00	16.00	17.00	22.50	24.00	30.00	32.00
1½	38	20.00	21.00	22.00	23.00	30.00	31.50	40.00	42.00
2	50	25.00	26.00	27.50	28.50	37.50	39.00	50.00	52.00
2½	64	33.75	35.00	37.25	38.50	50.75	52.50	67.50	70.00
3	76	43.75	45.00	47.75	49.00	65.75	67.50	87.50	90.00
3½	90	58.75	60.00	63.75	65.00	88.25	90.00	117.50	120.00
4	100	68.00	70.00	73.00	75.00	102.00	105.00	136.00	140.00
4½	113	78.00	80.00	83.00	85.00	117.00	120.00	156.00	160.00
5	125	93.00	95.00	98.00	100.00	137.00	140.00	186.00	190.00
6	150	123.00	125.00	133.00	135.00	187.00	190.00	246.00	250.00

Reducing Brass Flanged Fittings made to order. Prices on application.

BACK VIEW, SHOWING HUB

COMPANION FLANGES



VIEW, SHOWING FACE

CODE: BEURSSPEL

Size.....Inches	1	1¼	1½	2	2½	3	3½	4	4½	5	6
SizeMillimeters	25	32	38	50	64	76	90	100	113	125	150
Diam. of Flange	4½	5	6	6½	7½	8¼	9	10	10½	11	12½
Faced....Each	5.75	6.75	8.75	10.75	12.50	15.50	19.25	24.25	26.75	29.00	36.50
Fed.&Drill'dEa	6.00	7.00	9.00	11.00	13.00	16.00	20.00	25.00	27.50	30.00	37.50

Extra Heavy Brass Flanged Fittings and Companion Flanges are furnished with the edge of flanges finished.

Unless otherwise specified, we will always furnish our Extra Heavy Brass Flanged Fittings and Companion Flanges with plain faces, scored with shallow "V" grooves inside of bolt holes.

When coupled with Extra Heavy Iron Flanges, Valves or Fittings, the iron fittings or valves should be ordered with plain faces.

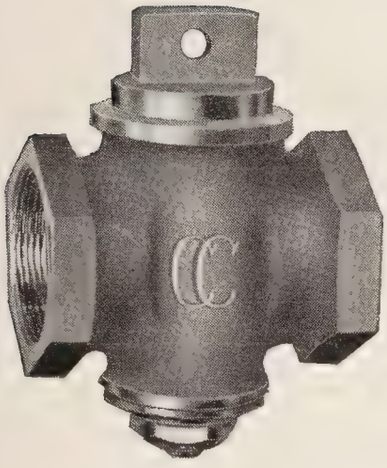
We will make to order at a special price, Extra Heavy Brass Flanged Fittings from any of our Extra Heavy Cast Iron Patterns, as shown on pages 438 to 446.

FOR GENERAL DIMENSIONS, SEE PAGE 651
FOR DRILLING TEMPLATES, SEE PAGE 595

STANDARD

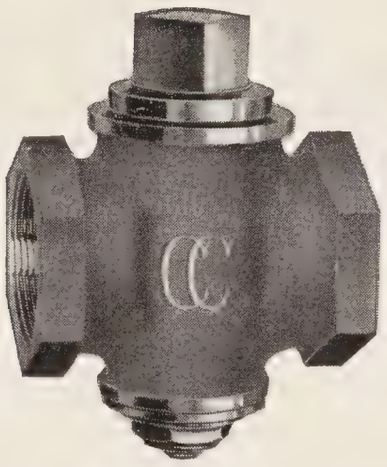
GAS SERVICE COCKS

BRASS



No. 270. FLAT HEAD

CODE: BEVRACHT

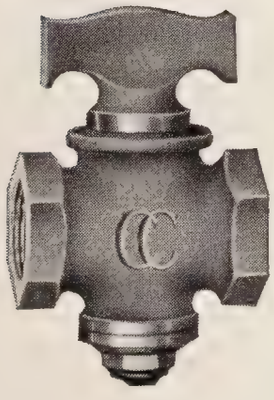


No. 272. SQUARE HEAD

CODE: BEWAFFNEN

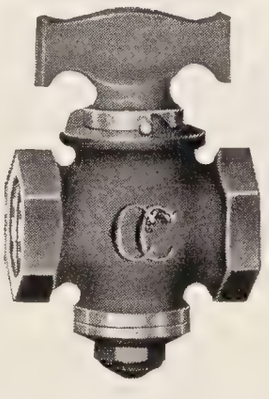
Size.....Inches	¼	⅜	½	¾	1	1¼	1½	2
Size.....Millimeters	6	10	13	19	25	32	38	50
No. 270, Flat Head.....Each	.90	1.00	1.10	1.30	2.10	3.25	4.60	8.00
No. 272, Square Head....Each	.90	1.00	1.10	1.30	2.10	3.25	4.60	8.00

Unless otherwise ordered, Flat Head Cocks will always be furnished.



No. 276. TEE HANDLE

CODE: BEWANGDEN



No. 278. WITH CHECK

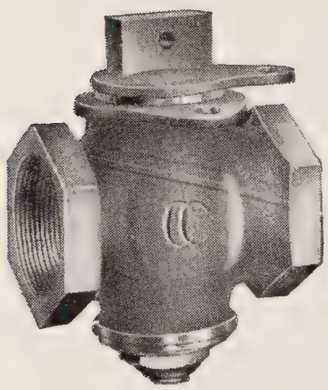
CODE: BEWEGELIJK

Size.....Inches	¼	⅜	½	¾
Size.....Millimeters	6	10	13	19
No. 276.....Each	.90	1.00	1.10	1.30
No. 278, with Check.....Each	1.00	1.15	1.30	1.55

GAS SERVICE COCKS

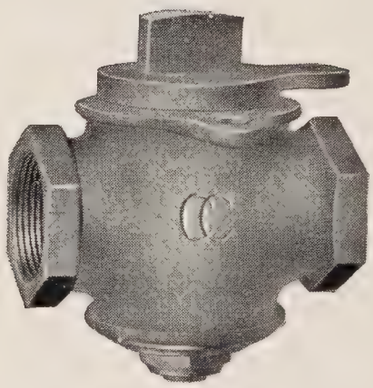
BRASS

LOCK COCKS



No. 284. FLAT WAY

CODE: BEWELKOMEN



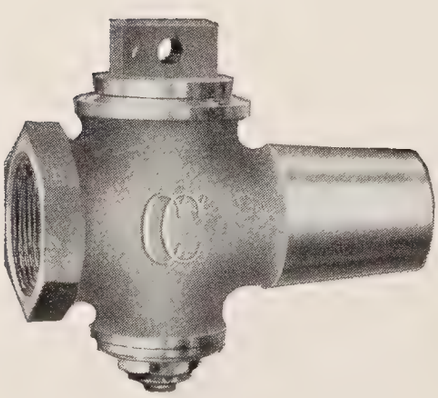
No. 285. ROUND WAY

CODE: BEWILLIGEN

Size.....Inches	½	¾	1	1¼	1½	2
Size.....Millimeters	13	19	25	32	38	50
No. 284, Flat Way.....Each	1.40	1.60	2.50	3.85	5.35	9.00
No. 285, Round Way.....Each		2.30				

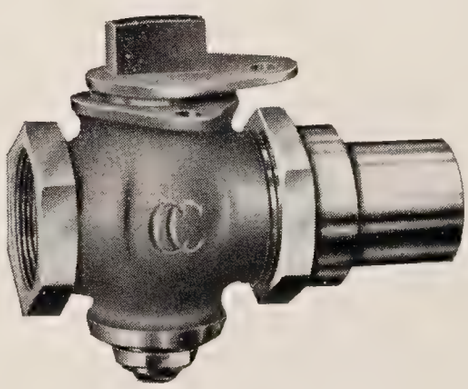
No. 285 Round-Way Opening Lock Cocks are made of Red Brass.

METER COCKS



No. 280. FLAT HEAD WITHOUT UNION END

CODE: BEWIMPELEN



No. 288. FLAT HEAD WITH UNION END

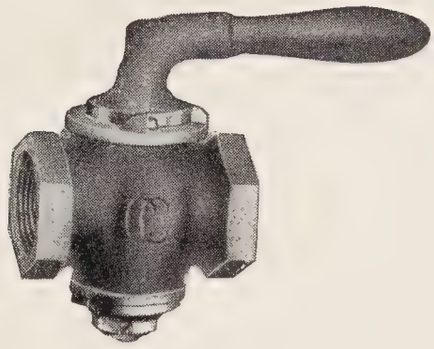
CODE: BEWOGEN

Size.....Inches	¾
Size.....Millimeters	19
No. 280.....Each	1.30
No. 288.....Each	2.35

PRICES DO NOT INCLUDE LOCK

BRASS GAS STOVE COCKS

WITH CHECK LEVER HANDLE

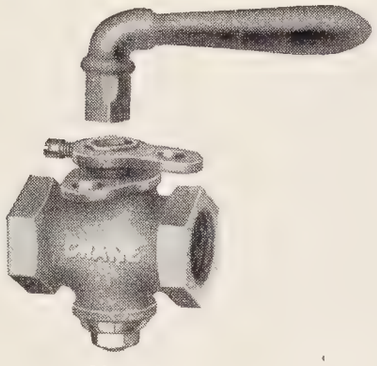


No. 298
CODE: BEWORFELST

Size.....Inches	¼	⅜	½	¾	1
Size.....Millimeters	6	10	13	19	25
Price, with Check.....Each	1.15	1.25	1.35	2.15	3.25

BRASS APARTMENT HOUSE COCK

LOCK UP REMOVABLE IRON HANDLE



No. 289
CODE: BEWRAYMENT

½ inch only.....Each	1.50

Recommended for use in apartment houses where several meters are connected to one range.

WRENCHES FOR BRASS STEAM AND GAS COCKS

SQUARE HEAD MALLEABLE IRON

CODE: BEWUNDERN

Size.....Inches	¼	⅜	½	¾	1	1¼	1½	2	2½ & 3	3½ & 4
Size.....Millimeters	6	10	13	19	25	32	38	50	64 & 76	90 & 100
Number.....	1	2	3	4	5	6	7	8	9	10
Square Head.....Each	.05	.06	.07	.09	.14	.19	.25	.44	.56	1.00

FLAT HEAD MALLEABLE IRON

CODE: BIADASSI

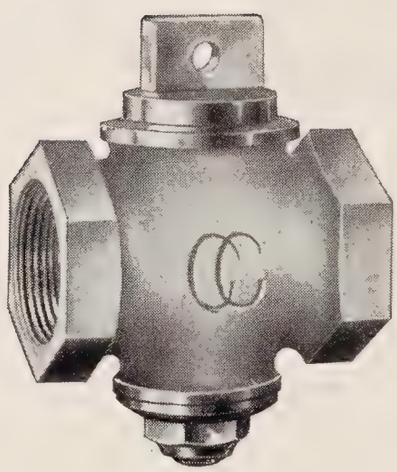
Size.....Inches	¼	⅜	½	¾	1	1¼	1½	2
Size.....Millimeters	6	10	13	19	25	32	38	50
Number.....	00	0	1	2	3	5	6	7
Flat Head.....Each	.05	.06	.07	.09	.14	.25	.44	.56

Above Wrenches suitable for all Flat Head Brass, Steam and Gas Cocks, except Nos. 262 and 266, Wrenches for which should be ordered from following table.

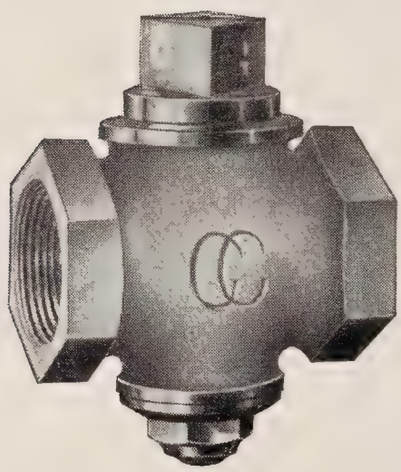
Size.....Inches	½	¾	1	1¼	1½	2
Size.....Millimeters	13	19	25	32	38	50
Number.....	2	3	5	6	7	8

The above Wrenches do not fit Iron Cocks. Wrenches for Iron Cocks, see Price List, page 110.

HEAVY
GAS SERVICE COCKS
BRASS



No. 292. FLAT HEAD
CODE: BIANUAL



No. 294. SQUARE HEAD
CODE: BIATOMIQUE

Size.....Inches	¼	⅜	½	¾	1	1¼	1½	2	2½	3
Size.Millimeters	6	10	13	19	25	32	38	50	64	76
Price.....Each	1.10	1.20	1.30	1.80	3.00	4.50	6.50	11.20	24.50	37.80

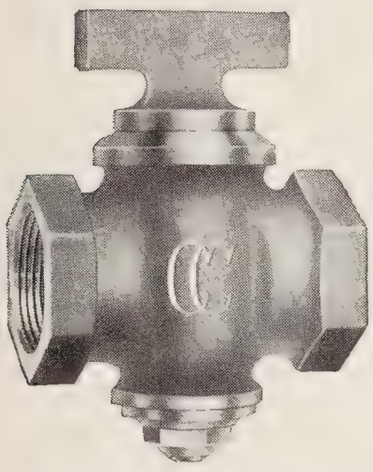
Flat Head Gas Cocks are always furnished, unless otherwise ordered.

These goods are made to supply a demand by certain gas companies for a superior article. They are strong and especially well ground.

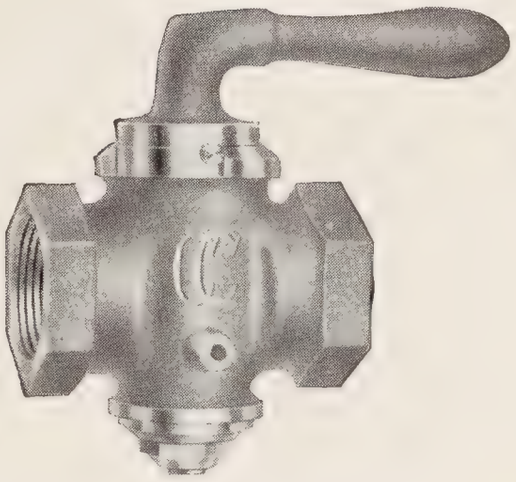
ALL COCKS ARE THOROUGHLY TESTED BEFORE LEAVING THE FACTORY

ROUGH STOPS
BRASS
WITH PIPE THREADS

TEE OR LEVER HANDLE — NUT AND WASHER



No. 804. TEE HANDLE
CODE: BIBEBUCH



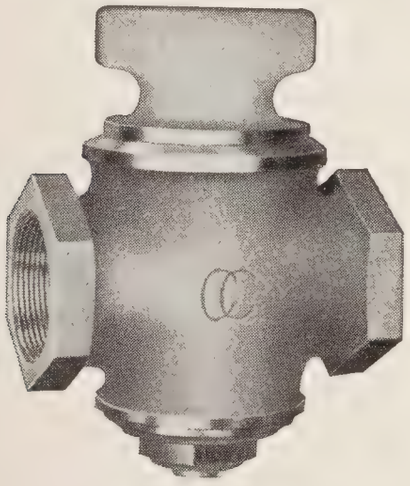
No. 806. LEVER HANDLE
CODE: BICONJUGUE

Size.....Inches	3/8	1/2	5/8	3/4	1	1 1/4	1 1/2	2
Size.....Millimeters	10	13	16	19	25	32	38	50
No. 804, Tee Handle..Per dozen	20.40	21.00	29.40	36.00	52.80	89.40	149.40	258.00
No. 804, Lever Handle..Per doz.	20.40	21.00	29.40	36.00	52.80	89.40	149.40	258.00
No. 806, Tee Handle with Check and Waste..Per doz.	21.00	21.60	30.00	36.60	54.00	91.20	152.40	264.00
No. 806, Lever Handle with Check and Waste..Per doz.	21.00	21.60	30.00	36.60	54.00	91.20	152.40	264.00

WASTE TUBES EXTRA.

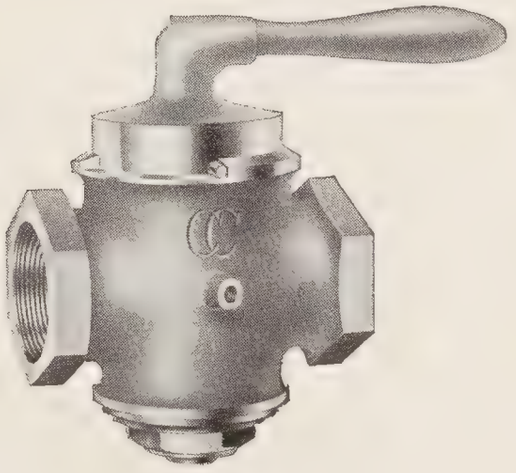
ROUND-WAY ROUGH STOPS
BRASS
WITH PIPE THREADS

TEE OR LEVER HANDLE — NUT AND WASHER



No. 812. TEE HANDLE

CODE: BIDKAPEL



No. 812. LEVER HANDLE
WITH CHECK AND WASTE
CODE: BIJENBLAD

Size.....Inches	1/2	5/8	3/4	1	1 1/4	1 1/2	2
Size.....Millimeters	13	16	19	25	32	38	50
No. 812, Tee Handle....Per dozen	26.40	36.00	46.20	73.80	120.60	197.40	342.00
No. 812, Lever Handle..Per dozen	26.40	36.00	46.20	73.80	120.60	197.40	342.00
No. 812, Tee Handle with Check and Waste...Per Doz.	27.00	36.60	46.80	75.00	122.40	200.40	348.00
No. 812, Lever Handle with Check and Waste..Per Doz.	27.00	36.60	46.80	75.00	122.40	200.40	348.00

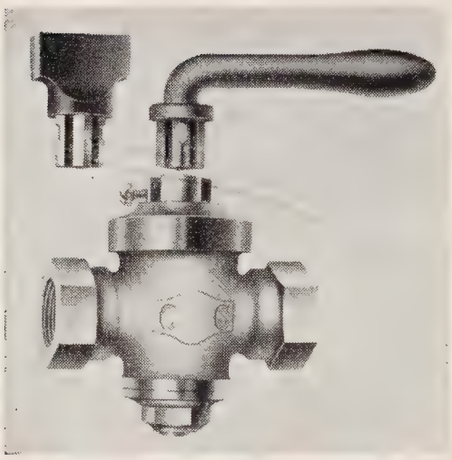
WASTE TUBES EXTRA.

REVERSIBLE STOP AND STOP AND WASTE COCKS

BRASS

TESTED TO 200 POUNDS HYDRAULIC PRESSURE
WITH PIPE THREADS

INTERCHANGEABLE FROM LEFT TO RIGHT

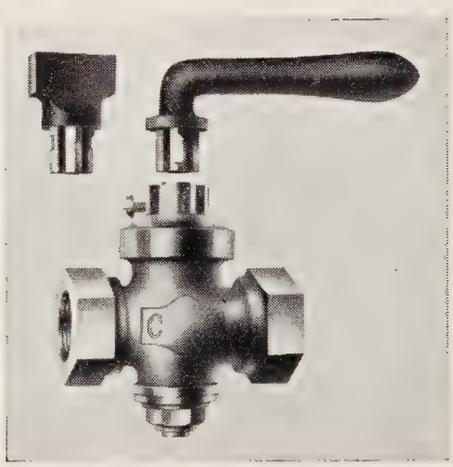


No. 820 FLAT WAY, STOP
CODE: BIJGEDRUKT

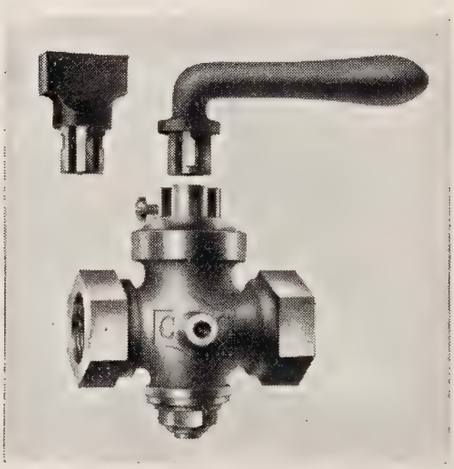
No. 820 FLAT WAY, STOP AND WASTE
CODE: BIJHARKING

TEE OR LEVER HANDLE

Size ..... Inches	½	⅝	¾	1
Flat Way Stop..... Per Dozen	21.00	29.40	36.00	52.80
Flat Way Stop and Waste... Per Dozen	21.60	30.00	36.60	54.00



No. 822 ROUND WAY, STOP
CODE: BIJLHOUW



No. 822 ROUND WAY, STOP AND WASTE
CODE: BIJWONENDE

TEE OR LEVER HANDLE

Size ..... Inches	½	⅝	¾	1
Round Way Stop..... Per Dozen	26.40	36.00	46.20	73.80
Round Way Stop and Waste. Per Dozen	27.00	36.60	46.80	75.00

These Reversible Stop Cocks are fully guaranteed as to workmanship and material. They embody the best points of other makes of Cocks, and also important features of our own design.

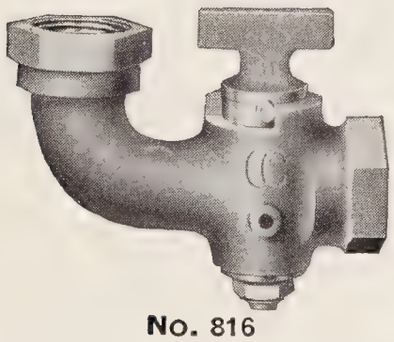
When ordering, always give style number, and state if they are wanted with or without waste, and whether with Tee or Lever Handle. Unless otherwise specified, we will furnish Lever Handle Cocks.

WASTE TUBES EXTRA

HYDRANT AND CORPORATION COCKS

BRASS
HYDRANT COCKS
FOR IRON PIPE

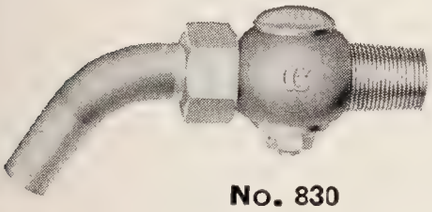
GROUND KEY



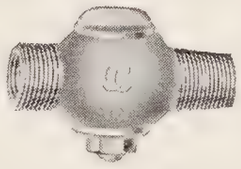
No. 816
T HANDLE
CODE: BILAMELLE

Size.....Inches	½	¾	1	1¼
Size.....Millimeters	13	19	25	32
Price, Rough.....Per Dozen	$25.80	$45.00	$64.80	$103.80

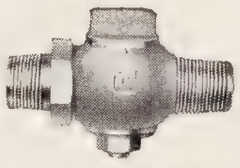
CORPORATION STOP COCKS



No. 830
CODE: BILANX

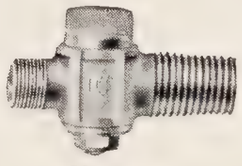


No. 833
CODE: BILBEBAMUS



No. 834
CODE: BILBIVANO

No. 835
CODE: BILBUNTO



No. 836
CODE: BILDCHENS

Nos. 830 and 833. Have inside thread to fit Mueller, Payne's and Lennox Tapping Machine Screw Plugs, and long male thread for Mueller, Payne's and Lennox Taps.
No. 833. Has Iron Pipe Thread on outlet one size larger.
No. 834. Has Iron Pipe Threads both ends.
Nos. 835 and 836. Have coarse thread for Wood Pipe Mains.
No. 836. Has Iron Pipe Thread on outlet.
Nos. 830 and 835. Furnished with straight Tail Piece when so specified.
Nos. 833, 834 and 836. In ⅝-inch size, have ¾-inch Iron Pipe Thread on outlet.

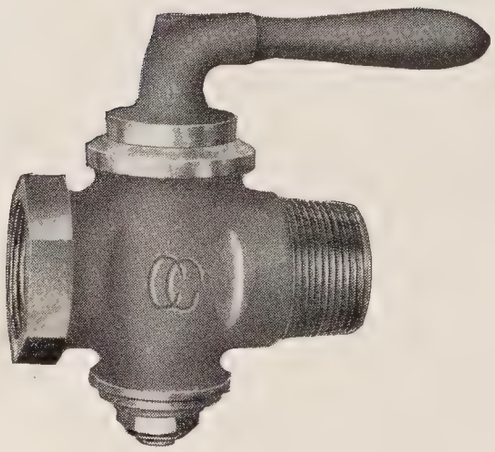
Size of Opening.....Inches	½	⅝	¾	1
No. 830.....Per Dozen	$19.20	$27.00	$34.20	$54.00
No. 833.....Per Dozen	17.40	23.40	30.00	48.00
No. 834.....Per Dozen	17.40	23.40	30.00	48.00
No. 835.....Per Dozen	24.00	32.40	40.80	64.80
No. 836.....Per Dozen	22.20	28.80	36.60	58.80

FOR HYDRANT KEYS, HYDRANT CLAMPS AND STREET WASHER KEYS, SEE PAGE 75.

BRINE COCKS

BRASS

MALE AND FEMALE **LEVER HANDLE**



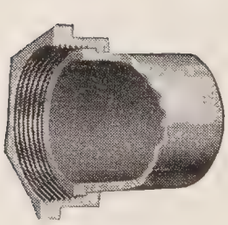
No. 814

CODE: BILDERGANG

Size.....Inches	3/8	1/2	3/4	1	1 1/4
Size.....Millimeters	10	13	19	25	32
Price.....Each	1.25	1.35	2.00	3.00	4.50

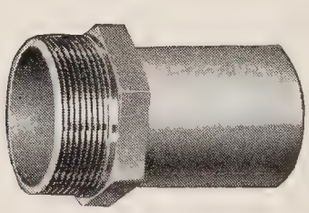
SOLDERING UNIONS AND NIPPLES

BRASS



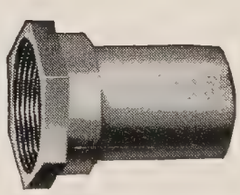
No. 842

CODE: BILHETINHO



No. 844

CODE: BILIGHERO



No. 846

CODE: BILINGUAL

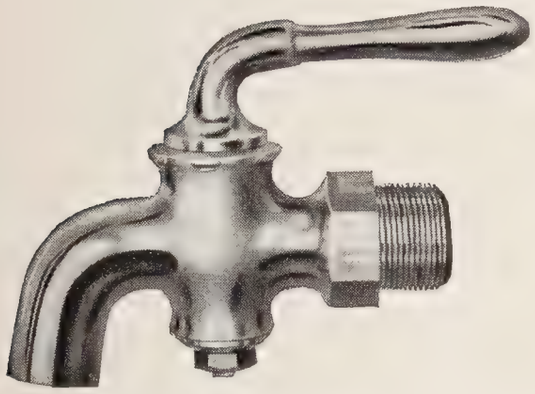
Size.....Inches	3/8	1/2	3/4	1	1 1/4	1 1/2	2
Size.....Millimeters	10	13	19	25	32	38	50
No. 842, Union.....Per Dozen	4.80	6.00	7.80	10.20	13.20	15.00	21.00
No. 844, Male Nipple..Per Dozen	3.60	4.20	6.00	8.40	10.80	15.00	21.00
No.846,Female Nipple. Per Dozen	3.60	4.20	6.00	8.40	10.80	15.00	21.00

Soldering Nipples larger than 2 inch, made to order at a special price.
Drainage Soldering Nipples, page 397.

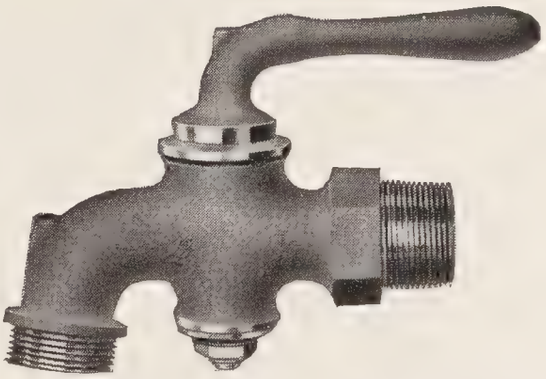
BRASS BIBB COCKS

SCREWED FOR IRON PIPE, WITH SHOULDER

LEVER HANDLE



No. 800. FINISHED, PLAIN
CODE: BILLEBARRE



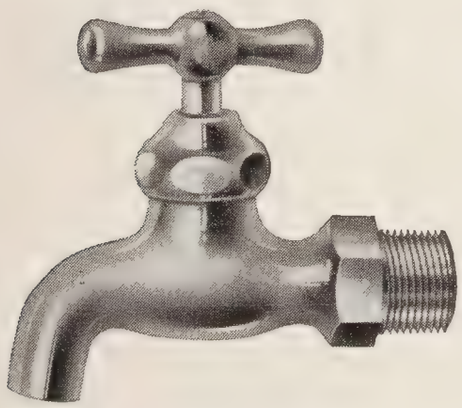
No. 801. ROUGH, FOR HOSE
CODE: BILOQUAIS

Size.....Inches	3/8	1/2	3/4	1
Size.....Millimeters	10	13	19	25
No. 800, Rough Bibbs, Plain.....Per Dozen	20.40	21.00	29.40	52.80
No. 800, Finished Bibbs, Plain.....Per Dozen	25.20	25.80	35.40	64.80
No. 801, Rough Bibbs for Hose.....Per Dozen		24.00	32.40	60.00
No. 801, Finished Bibbs for Hose.....Per Dozen		28.80	38.40	72.00

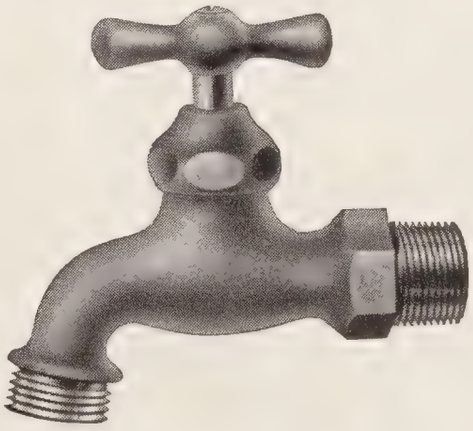
Size.....Inches	1 1/4	1 1/2	2	.....
Size.....Millimeters	32	38	50	.....
No. 800, Rough Bibbs, Plain.....Per Dozen	89.40	149.40	258.00	.....
No. 800, Finished Bibbs, Plain.....Per Dozen	107.40	179.40	300.00	.....
No. 801, Rough Bibbs for Hose.....Per Dozen	100.20	164.40	280.20	.....
No. 801, Finished Bibbs for Hose.....Per Dozen	118.20	194.40	322.20	.....

BRASS COMPRESSION BIBBS

SCREWED FOR IRON PIPE, WITH SHOULDER



No. 802. FINISHED, PLAIN
CODE: BINAREMOS



No. 803. ROUGH, FOR HOSE
CODE: BINASCESSE

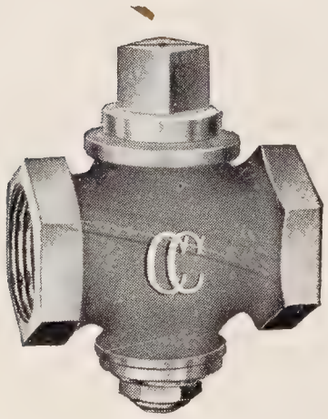
Size.....Inches	3/8	1/2	3/4	1	.....
Size.....Millimeters	10	13	19	25	.....
No. 802, Rough Bibbs, Plain.....Per Dozen	16.80	17.40	22.80	54.00	.....
No. 802, Finished Bibbs, Plain.....Per Dozen	18.60	19.80	25.20	60.00	.....
No. 803, Rough, for Hose.....Per Dozen		20.40	25.80	61.20	.....
No. 803, Finished, for Hose.....Per Dozen		22.80	28.20	67.20	.....

STANDARD

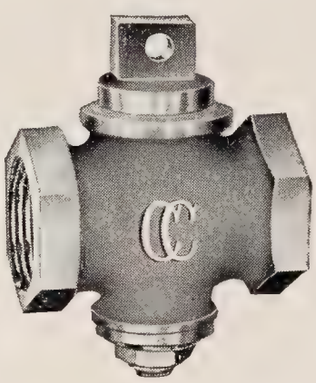
STEAM COCKS

BRASS

FOR STEAM WORKING PRESSURES UP TO 100 POUNDS



No. 250. SQUARE HEAD
CODE: BINDDRAHT

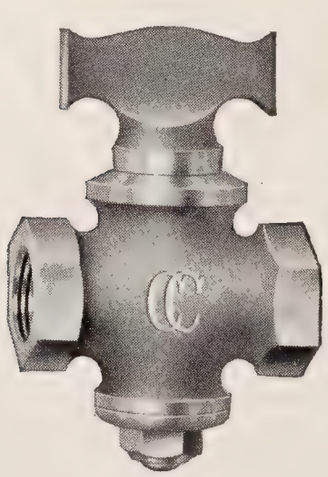


No. 252. FLAT HEAD
CODE: BINGLEY

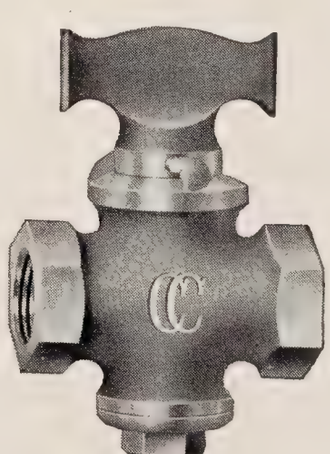
Size.....Inches	¼	⅜	½	¾	1	1¼
Size.....Millimeters	6	10	13	19	25	32
Nos. 250 and 252.....Each	.85	1.00	1.25	1.70	2.35	3.70
No. 254, Square Head, with Check....Each			1.40	1.90	2.55	3.95
Size.....Inches	1½	2	2½	3	3½*	4*
Size.....Millimeters	38	50	64	76	90	100
Nos. 250 and 252.....Each	4.85	7.30	14.50	22.50	38.50	50.00
No. 254, Square Head, with Check....Each	5.15	7.65				

*Note.—The 3½ and 4-inch Steam Cocks are made to order only at a special discount.

Square Head type will always be furnished unless otherwise ordered.



No. 256. TEE HANDLE
CODE: BINSIGER



No. 258. WITH CHECK
CODE: BIPALMADAS

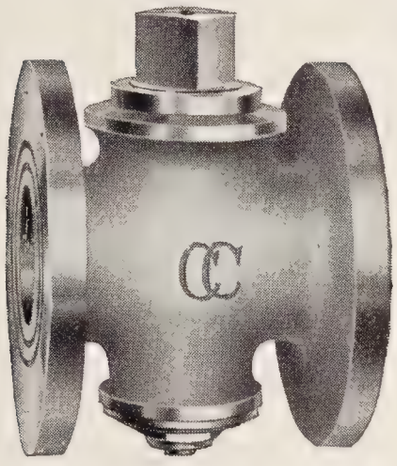
Size.....Inches	⅛	¼	⅜	½	¾	1
Size.....Millimeters	3	6	10	13	19	25
No. 256.....Each	.85	.85	1.00	1.25	1.70	2.35
No. 258, with Check.....Each		1.00	1.15	1.40	1.90	2.55

STANDARD

STEAM COCKS

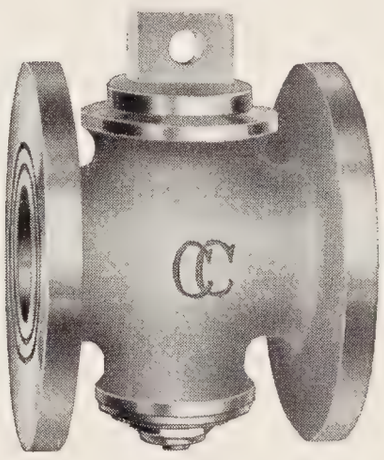
BRASS

FOR STEAM WORKING PRESSURES UP TO 100 POUNDS



No. 265 FLANGED SQUARE HEAD

CODE: BIPARASITO



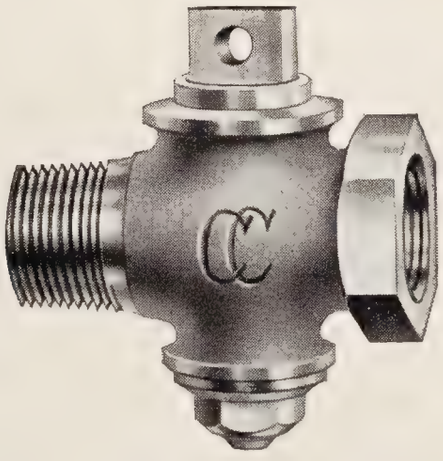
No. 263 FLANGED FLAT HEAD

CODE: BIPLUME

Size.....Inches	¾	1	1¼	1½	2	2½
Size.....Millimeters	19	25	32	38	50	64
Price, Square or Flat Head.....Each	5.50	7.30	9.70	11.75	18.00	27.50
Diameter of Flanges.....Inches	3½	4	4½	5	6	7
Size.....Inches	3	3½	4	5	6	
Size.....Millimeters	76	90	100	125	150	
Price, Square or Flat Head.....Each	43.00	62.00	84.00	150.00	275.00	
Diameter of Flanges.....Inches	7½	8½	9	10	11	

Square Head Type will always be furnished unless otherwise ordered.
These Cocks are made to order only.
Templates for drilling, page 595. Price List for drilling, page 483.

MALE AND FEMALE



No. 266 FLAT HEAD

CODE: BISLACCHE

Size.....Inches	¼	⅜	½	¾	1	1¼	1½	2
Size.....Millimeters	6	10	13	19	25	32	38	50
Price.....Each	1.35	1.45	2.00	2.50	3.00	5.35	6.75	9.85

STANDARD

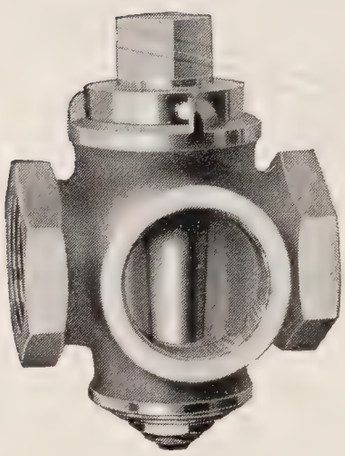
STEAM COCKS

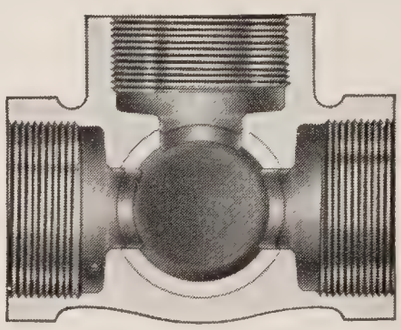
BRASS

FOR STEAM WORKING PRESSURES UP TO 100 POUNDS

THREE WAY

WITH EXTRA LARGE PLUG AND FULL OPENINGS



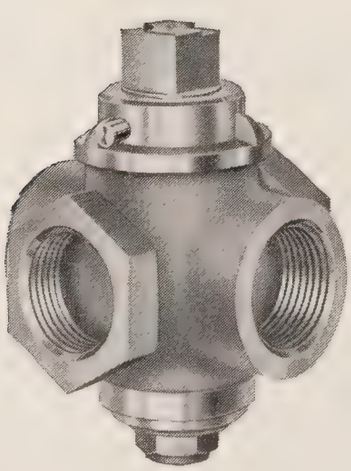


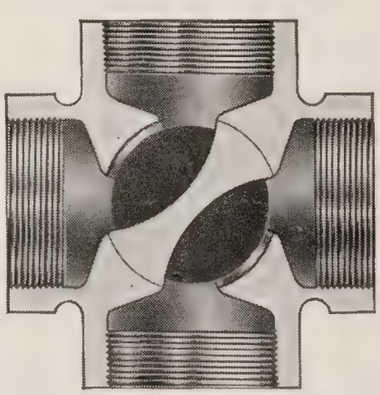
No. 268 SQUARE HEAD, WITH CHECK

CODE: BISMARQUER

Size.....Inches	¼	⅜	½	¾	1	1¼	1½	2	2½	3
Size.....Millimeters	6	10	13	19	25	32	38	50	64	76
Price.....Each	1.80	2.10	2.50	3.00	3.75	5.75	7.15	11.00	18.75	26.00

FOUR WAY





No. 269 SQUARE HEAD

CODE: BISNIPOTE

Size.....Inches	½	¾	1	1¼	1½	2
Size.....Millimeters	13	19	25	32	38	50
Price.....Each	6.00	8.50	11.00	14.50	17.50	25.00

The No. 269 Cocks are made to order only.

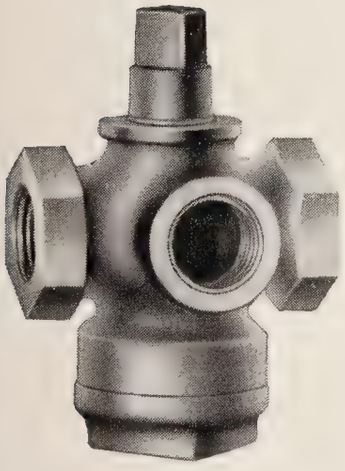
STANDARD
SPRING LOADED COCKS

FOR COMPRESSED AIR LINES

BRASS

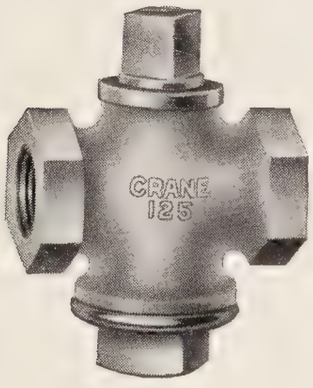
TESTED UNDER AIR PRESSURE

FOR AIR WORKING PRESSURES UP TO 125 POUNDS
FOR COLD WATER WORKING PRESSURES UP TO 175 POUNDS



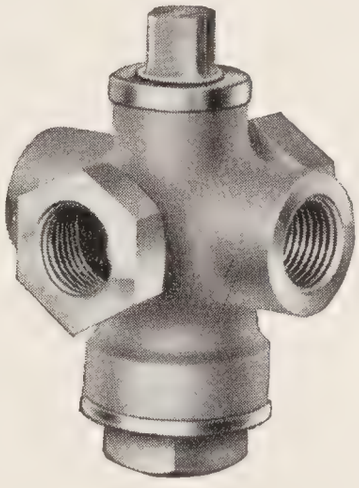
No. 306, THREE WAY

CODE: BISOLEM



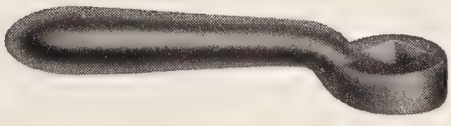
No. 305

CODE: BISOGNASTI



No. 307, FOUR WAY

CODE: BISOMARUM



WRENCH

CODE: BISONHARIA

Size	Inches	¼	⅜	½
Size	Millimeters	6	10	13
No. 305	Each	3.00	3.25	4.50
No. 306, Three Way	Each	3.50	4.25	5.25
No. 307, Four Way	Each	5.00	5.00	6.75
Wrench, Extra	Each	.15	.15	.15

OTHER SIZES MADE TO ORDER. PRICES ON APPLICATION

The Spring, which is located between the ground plug and the cap, automatically takes up wear, insuring a tight joint between the plug and body, and at the same time allows an easy movement of the plug.

The efficiency and durability of these Cocks, especially under hard and trying service conditions, will be appreciated by all users.

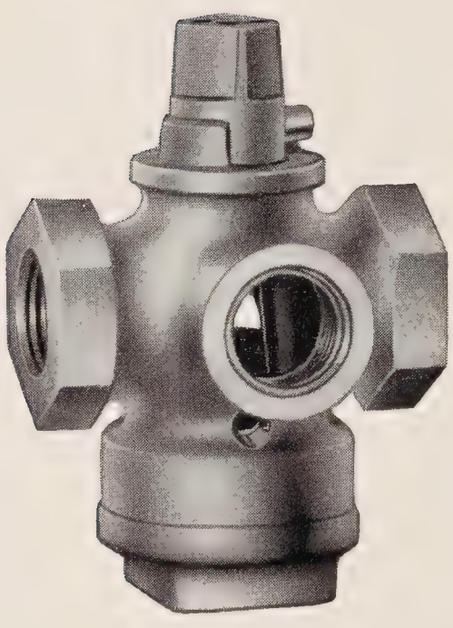
For Iron Body Spring Loaded Cocks, see page 107.

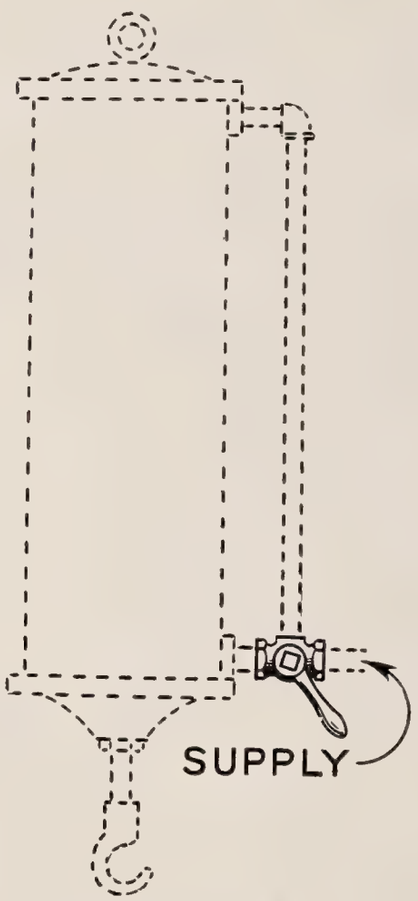
For Iron Body Four-Way Spring Loaded Cocks, see page 111.

STANDARD
SPECIAL THREE WAY SPRING LOADED COCK
WITH CHECK
BRASS
FOR AIR HOIST CONTROL

TESTED UNDER AIR PRESSURE

SUITABLE FOR AIR WORKING PRESSURES UP TO 125 POUNDS





No. 308

CODE: BISPALIA

Size	Inches	3/8	1/2
Size	Millimeters	10	13
Price	Each	5.50	7.50
Wrench, Extra	Each	.15	.15

OTHER SIZES MADE TO ORDER. PRICES ON APPLICATION

These Cocks are highly recommended for controlling the operation of Air Hoists.

In raising the load the full pressure enters the bottom of the cylinder and raises the piston, forcing the air in the upper part of the cylinder out through the exhaust port in the Cock.

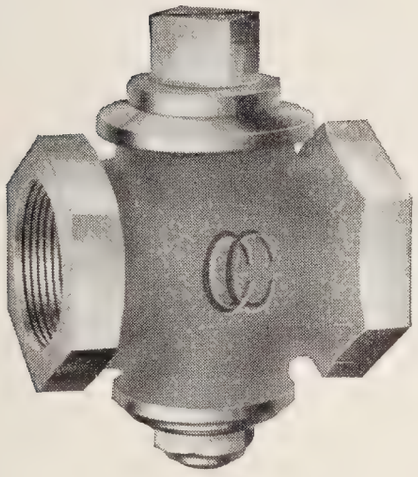
When the load is lowered, the air in the lower part of the cylinder passes through the Cock into the upper part of the cylinder. In this way the only air used is that required to raise the load.

The Spring automatically takes up wear.

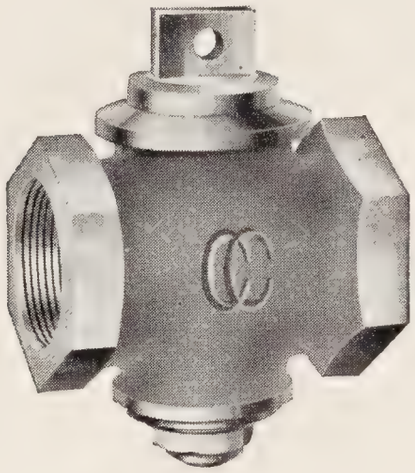
HEAVY STANDARD STEAM COCKS

BRASS

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS



No. 260. SQUARE HEAD
CODE: BISQUASSE



No. 262. FLAT HEAD
CODE: BISSIGSTE

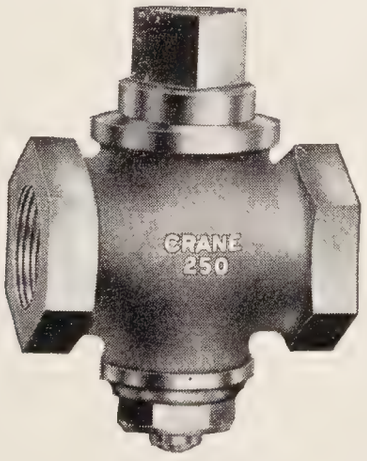
Size.....Inches	½	¾	1	1¼	1½	2	2½	3
Size.....Millimeters	13	19	25	32	38	50	64	76
Price.....Each	1.25	1.70	2.35	3.70	4.85	7.30	14.50	22.50

These Cocks are made to supply a demand for a heavier Cock than the Standard.

EXTRA HEAVY STEAM COCKS

HARD METAL (BRONZE)

FOR STEAM WORKING PRESSURES UP TO 250 POUNDS



No. 80 E. SQUARE HEAD
CODE: BLACHFROST

Size.....Inches	¼	⅜	½	¾	1	1¼	1½	2	2½	3
SizeMillimeters	6	10	13	19	25	32	38	50	64	76
Price.....Each	1.40	1.75	1.75	2.40	3.60	6.00	7.75	11.50	23.00	35.00

These Cocks are made of hard metal, are extra heavy and have liberal bearings. These important features insure a tight cock which will give good service.
For Wrenches see page 91.

STANDARD
IRON COCKS
FOR LIQUID WORKING PRESSURES UP TO 125 POUNDS

FLAT HEAD
No. 320½—ALL IRON
CODE: BLADKEVER
No. 322½—BRASS WASHER
CODE: BLAKELING
No. 324½—BRASS PLUG
CODE: BLESIDADE

SQUARE HEAD
No. 320—ALL IRON
CODE: BLACKSHORL
No. 322—BRASS WASHER
CODE: BLAFSTER
No. 324—BRASS PLUG
CODE: BLANDEABA

ALL IRON COCKS

Size ..... Inches	½	¾	1	1¼	1½	2	2½
Size ..... Millimeters	13	19	25	32	38	50	64
Nos. 320, 320½, Screwed Each	.90	1.05	1.30	1.60	1.95	2.70	4.40
Galvanized ..... Each	1.35	1.60	1.95	2.40	2.95	4.05	6.60
Size ..... Inches	3	3½	4	5	6	8	
Size ..... Millimeters	76	90	100	125	150	200	
Nos. 320, 320½, Screwed Each	6.75	12.00	15.50	32.00	45.00	100.00	
Galvanized ..... Each	10.15	18.00	23.25	48.00	67.50	150.00	

IRON COCKS WITH BRASS WASHER

Size ..... Inches	½	¾	1	1¼	1½	2	2½
Size ..... Millimeters	13	19	25	32	38	50	64
Nos. 322, 322½, Screwed Each	1.00	1.20	1.55	1.95	2.35	3.20	5.15
Size ..... Inches	3	3½	4	5	6	8	
Size ..... Millimeters	76	90	100	125	150	200	
Nos. 322, 322½, Screwed Each	7.75	14.00	19.00	38.00	53.00	110.00	

IRON COCKS WITH BRASS PLUG

Size ..... Inches	½	¾	1	1¼	1½	2	2½
Size ..... Millimeters	13	19	25	32	38	50	64
Nos. 324, 324½ Screwed Each	1.30	1.60	1.90	2.65	3.75	5.25	8.75
*Add to list for Brass Washer	.10	.15	.25	.35	.40	.50	.75
Size ..... Inches	3	3½	4	5	6	8	
Size ..... Millimeters	76	90	100	125	150	200	
Nos. 324, 324½, Screwed Each	13.00	27.50	36.50	67.00	94.00	200.00	
*Add to list for Brass Washer	1.00	2.00	3.50	6.00	8.00	10.00	

Sizes ½ inch to 2 inch will always be furnished with the Flat Head and sizes 2½ inch to 8 inch with the Square Head, unless otherwise ordered.

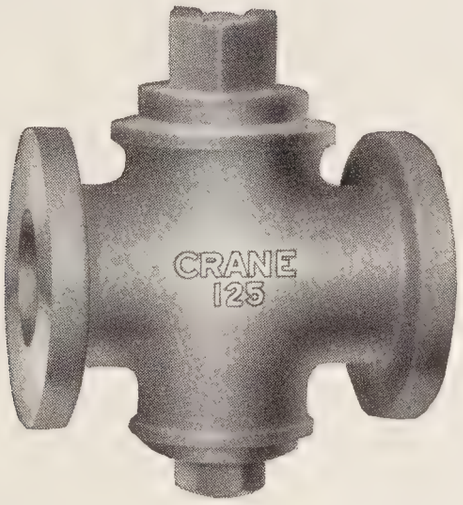
These Cocks will be furnished with a Check (Stop) when so ordered, at a special price.

*Iron Cocks with Brass Plug and Brass Washer are not carried in stock.

STANDARD

IRON COCKS

FOR LIQUID WORKING PRESSURES UP TO 125 POUNDS



SQUARE HEAD

FLANGED No. 325—ALL IRON
CODE: BLETONISM
FLANGED No. 327—BRASS WASHER
CODE: BLOQUA
FLANGED No. 329—BRASS PLUG
CODE: BLUEPAIDLE

FLAT HEAD

FLANGED No. 325½—ALL IRON
CODE: BLINZAUGIG
FLANGED No. 327½—BRASS WASHER
CODE: BLUEBREAST
FLANGED No. 329½—BRASS PLUG
CODE: BLUMGEWIRK

ALL IRON COCKS

Size.....Inches	2	2½	3	3½	4	5	6	8
Size.....Millimeters	50	64	76	90	100	125	150	200
Nos. 325, 325½, Flanged.Each	4.25	6.25	9.50	15.00	19.00	36.00	50.00	107.00
Diameter of Flanges . . . Inches	6	7	7½	8½	9	10	11	13½

IRON COCKS WITH BRASS WASHER

Size.....Inches	2	2½	3	3½	4	5	6	8
Size.....Millimeters	50	64	76	90	100	125	150	200
Nos. 327, 327½, Flanged.Each	4.75	7.00	10.50	17.00	22.50	42.00	58.00	117.00
Diameter of Flanges . . . Inches	6	7	7½	8½	9	10	11	13½

IRON COCKS WITH BRASS PLUG

Size.....Inches	2	2½	3	3½	4	5	6	8
Size.....Millimeters	50	64	76	90	100	125	150	200
Nos. 329, 329½, Flanged.Each	7.00	10.50	15.75	30.00	40.00	70.00	100.00	210.00
Diameter of Flanges . . . Inches	6	7	7½	8½	9	10	11	13½

Square Head will always be furnished, unless otherwise ordered.

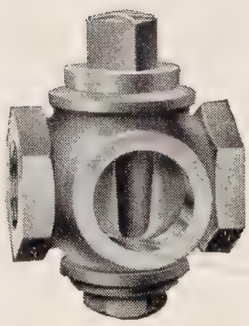
These Cocks will be furnished with a Check (Stop) when so ordered, at a special price.

Templates for drilling, page 596. Price List for drilling, page 483.

STANDARD

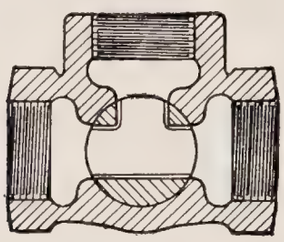
IRON THREE-WAY COCKS

FOR LIQUID WORKING PRESSURES UP TO 125 POUNDS

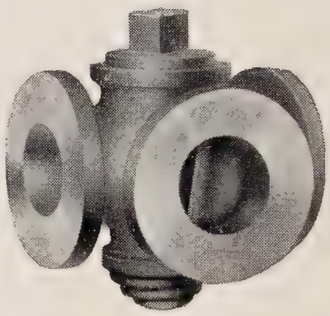


SCREWED

No. 326. ALL IRON
CODE: BODEMRAND
No. 328. BRASS WASHER
CODE: BOFETONES
No. 330. BRASS PLUG
CODE: BOHRBOGEN



THE PORTS IN THE PLUGS OF THESE COCKS ARE MADE AS ILLUSTRATED ABOVE. ANY OTHER ARRANGEMENT IS SPECIAL AND MADE TO ORDER ONLY.



FLANGED

No. 331. ALL IRON
CODE: BODROMIAS
No. 333. BRASS WASHER
CODE: BOHLENDACH
No. 335. BRASS PLUG
CODE: BOHRSTANGE

ALL-IRON THREE-WAY COCKS

Size	Inches	¾	1	1¼	1½	2	2½
Size	Millimeters	19	25	32	38	50	64
No. 326, Screwed	Each	1.65	1.80	2.05	2.65	3.65	5.35
No. 326, Screwed, Galvanized	Each	2.50	2.70	3.10	4.00	5.50	8.00
No. 331, Flanged	Each					7.00	9.00

Size	Inches	3	3½	4	5	6	
Size	Millimeters	76	90	100	125	150	
No. 326, Screwed	Each	7.50	14.00	19.00	36.50	52.00	
No. 326, Screwed, Galvanized	Each	11.25	21.00	28.50	54.75	78.00	
No. 331, Flanged	Each	12.75		26.00	44.00	60.00	

IRON THREE-WAY COCKS WITH BRASS WASHER

Size	Inches	¾	1	1¼	1½	2	2½
Size	Millimeters	19	25	32	38	50	64
No. 328, Screwed	Each	1.80	2.05	2.40	3.05	4.15	6.10
No. 333, Flanged	Each					7.50	9.75

Size	Inches	3	3½	4	5	6	
Size	Millimeters	76	90	100	125	150	
No. 328, Screwed	Each	8.50	16.00	22.50	42.50	60.00	
No. 333, Flanged	Each	13.75		29.50	50.00	68.00	

IRON THREE-WAY COCKS WITH BRASS PLUG

Size	Inches	¾	1	1¼	1½	2	2½
Size	Millimeters	19	25	32	38	50	64
No. 330, Screwed	Each	2.20	2.40	3.10	4.50	6.25	9.75
No. 335, Flanged	Each					9.50	13.25

Size	Inches	3	3½	4	5	6	
Size	Millimeters	76	90	100	125	150	
No. 330, Screwed	Each	13.75	30.00	40.00	71.50	100.00	
No. 335, Flanged	Each	19.00		47.00	80.00	108.00	

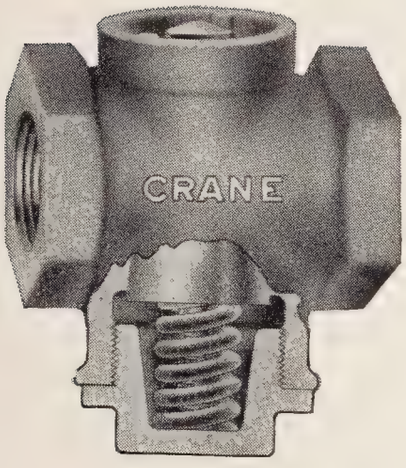
These Cocks will be furnished with a Check Stop when so ordered, at a special price.
Templates for drilling, page 596. Price List for drilling, page 483.

CRANE MINE COCKS
FOR COMPRESSED AIR LINES

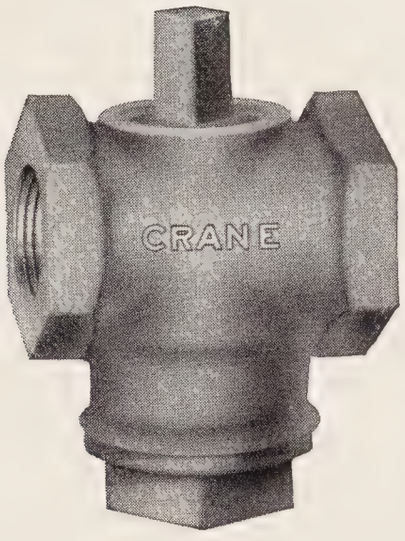
IRON BODY BRASS PLUG STEEL SPRING

TESTED UNDER AIR PRESSURE

SUITABLE FOR 125 POUNDS AIR PRESSURE AND
175 POUNDS COLD WATER WORKING PRESSURE



No. 318, LOCK-SHIELD TRIANGULAR HEAD
CODE: BOKSBLOK



No. 319, EXPOSED SQUARE HEAD
CODE: BOLASSEM

Size.....Inches	½	¾	1	1¼	1½	2	3*	4*
Size.....Millimeters	13	19	25	32	38	50	76	100
No. 318.....Each	2.25	2.40	2.40	2.65	4.00	6 65	13.00	40.00
No. 319.....Each	2.25	2.40	2.40	2.65	4.00	6.65	13.00	40.00
Triangular Key Wrench.....Each	.20	.20	.20	.25	.40	.65	1.00	5.00
Square Key Wrench.....Each	.20	.20	.20	.25	.40	.65	1.00	5.00

*3 and 4 inch sizes are furnished with bolted cap.
The No. 318 prevents tampering—can only be operated with triangular wrench.
These Cocks are recommended for use on gasoline lines.
These Cocks are also made **ALL-IRON** at a special price.

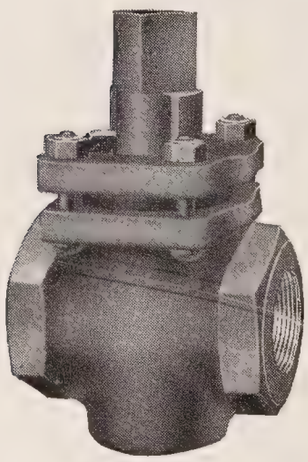
OTHER SIZES MADE TO ORDER AT A SPECIAL PRICE

ASBESTOS PACKED COCKS

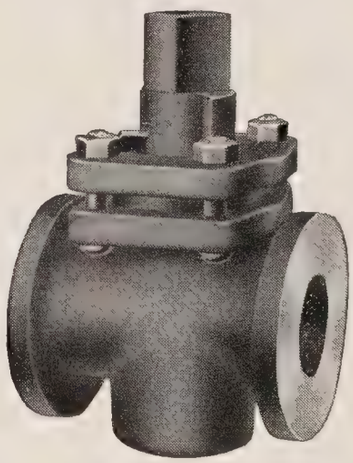
IRON BODY

BUSHING AND CHANNEL PACKED

SUITABLE FOR WORKING PRESSURES UP TO 150 POUNDS



No. 310. SCREWED
CODE: BOVICHTHYS



No. 311. FLANGED
CODE: BRABEUTAM

Size	Inches	1/8	1/4	3/8	1/2
Size	Millimeters	3	6	10	13
No. 310, Screwed, Channel Packed	Each	1.60	1.60	1.60	1.60
No. 310, Screwed, Bushing Packed	Each				1.75
No. 311, Flanged, Channel Packed	Each				
No. 311, Flanged, Bushing Packed	Each				
Diameter of Flanges	Inches				
Face to Face	Inches				
Size	Inches	3/4	1	1 1/4	1 1/2
Size	Millimeters	19	25	32	38
No. 310, Screwed, Channel Packed	Each	2.10	2.50	3.50	4.75
No. 310, Screwed, Bushing Packed	Each	2.30	2.75	3.85	5.25
No. 311, Flanged, Channel Packed	Each		2.50	3.50	4.75
No. 311, Flanged, Bushing Packed	Each		2.75	3.85	5.25
Diameter of Flanges	Inches		4	4 1/2	5
Face to Face	Inches		5 1/2	5 3/4	5 7/8
Size	Inches	2	2 1/2	3	3 1/2
Size	Millimeters	50	64	76	90
No. 310, Screwed, Channel Packed	Each	7.00	12.00	18.00	27.00
No. 310, Screwed, Bushing Packed	Each	7.75	13.25	20.00	30.00
No. 311, Flanged, Channel Packed	Each	7.00	12.00	18.00	27.00
No. 311, Flanged, Bushing Packed	Each	7.75	13.25	20.00	30.00
Diameter of Flanges	Inches	6	7	7 1/2	8 1/2
Face to Face	Inches	7 1/8	8 1/4	9 1/4	10 1/4
Size	Inches	4	5	6	
Size	Millimeters	1.00	1.25	1.50	
No. 310, Screwed, Channel Packed	Each	30.00	45.00	60.00	
No. 310, Screwed, Bushing Packed	Each	35.00			
No. 311, Flanged, Channel Packed	Each	30.00	45.00	60.00	
No. 311, Flanged, Bushing Packed	Each	35.00			
Diameter of Flanges	Inches	9	10	11	
Face to Face	Inches	11 1/2	13 3/4	16	

We can furnish Asbestos Packed Cocks as follows: Heavy, Extra Heavy, Angle, Three-way and for Ammonia.

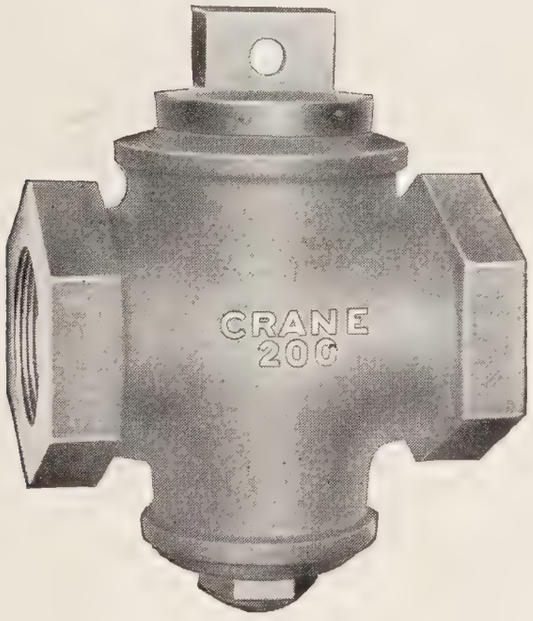
Prices on application.

HEAVY DUTY

IRON COCKS

FLAT HEAD

FOR LIQUID WORKING PRESSURE UP TO 200 POUNDS



Nos. 332, 334, 336, 337 SCREWED

WITH MALLEABLE IRON PLUG, NUT AND WASHER
CODE: BRANDHULFE

Size.....Inches	1	1¼	1½	2	2½	3	4
Size.....Millimeters	25	32	38	50	64	76	100
No. 332.....Each	2.50	3.00	4.00	5.00	10.00	13.00	31.00

ALL IRON COCKS WITH CAST IRON PLUG, NUT AND WASHER
CODE: BRANGLED

Size.....Inches	½	¾	1	1¼	1½	2	2½	3	4
Size.....Millimeters	13	19	25	32	38	50	64	76	100
No. 334.....Each	1.15	1.25	1.75	2.10	2.80	3.65	6.50	9.00	22.50

CAST IRON PLUG WITH BRASS WASHER
CODE: BRANQUEJAR

Size.....Inches	½	¾	1	1¼	1½	2	2½	3	4
Size.....Millimeters	13	19	25	32	38	50	64	76	100
No. 336.....Each	1.25	1.40	2.00	2.45	3.20	4.15	7.25	10.00	26.00

WITH BRASS PLUG
CODE: BRASPARTIJ

Size.....Inches	½	¾	1	1¼	1½	2	2½	3	4
Size.....Millimeters	13	19	25	32	38	50	64	76	100
No. 337.....Each	1.70	2.25	2.80	3.85	5.60	7.00	13.25	19.00	56.00

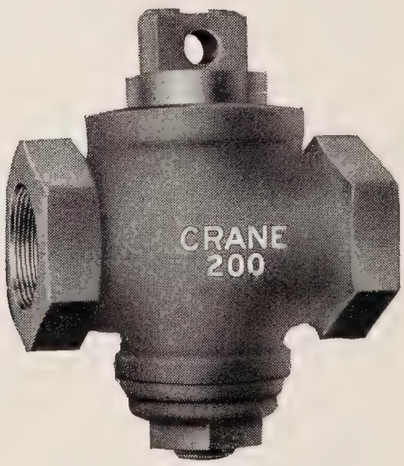
Flat Head Iron Cocks having plugs made of cast iron and brass, often have the heads twisted off in service. For this reason it was necessary for us to design a malleable iron plug for severe service conditions, as the malleable iron is much stronger and less likely to break off when opening and closing the Cock.

OIL COUNTRY PATTERN

IRON COCKS

FLAT HEAD

FOR LIQUID WORKING PRESSURES UP TO 200 POUNDS



No. 338
CODE: BRATENFETT

WITH CAST IRON PLUG AND BRASS WASHER

Size	Inches	1	2
Size	Millimeters	25	50
No. 338	Each	2.00	4.50
Weight each	Pounds	4¼	17½

Furnished with Brass Plug at a special price.
Square Head Oil Country Cocks furnished when so specified.

WRENCHES FOR ALL IRON COCKS

FLAT HEAD MALLEABLE IRON

CODE: BRATPFANNE
FOR FLAT HEAD STANDARD AND 200-LB. IRON COCKS

Size	Inches	½	¾	1	1¼	1½	2	2½	3
Size	Millimeters	13	19	25	32	38	50	64	76
Number		20	21	22	23	24	25	26	27
Price	Each	.20	.20	.35	.45	.60	.75	.90	1.25

WRENCHES

SQUARE HEAD MALLEABLE IRON

CODE: BRODASSENT
FOR SQUARE HEAD STANDARD IRON COCKS

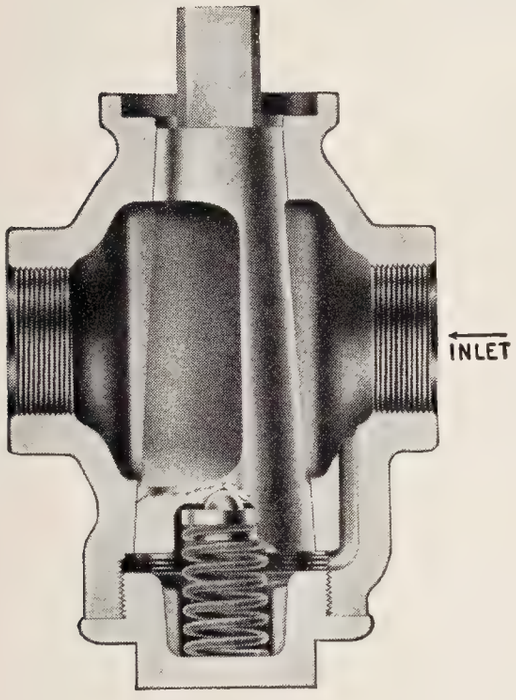
Size	Inches	½	¾	1	1¼	1½	2
Size	Millimeters	13	19	25	32	38	50
Number		30	31	32	33	34	35
Price	Each	.20	.20	.35	.45	.60	.75
Size	Inches	2½	3	3½	4	5	6
Size	Millimeters	64	76	90	100	125	150
Number		36	37	38	39	40	41
Price	Each	.90	1.25	1.50	1.65	1.90	2.10

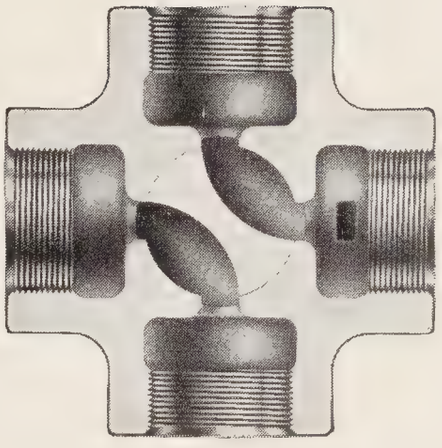
EXTRA HEAVY

FOUR WAY COCKS

IRON BODY, BRASS PLUG AND CAP **NICKEL PLATED STEEL SPRING**

FOR COLD WATER WORKING PRESSURES UP TO 350 POUNDS





No. 339 SCREWED

CODE: BRODKRUME

Size.....Inches	½	¾	1	1¼	1½	2
Size.....Millimeters	13	19	25	32	38	50
Price, Screwed.....Each	8.00	11.50	15.00	23.00	30.00	42.00

Cocks for air are specially ground at an extra price.

The spring, which is located between the ground plug and the cap, automatically takes up wear, insuring a tight joint between the plug and body, and at the same time allows a free and easy movement of the plug.

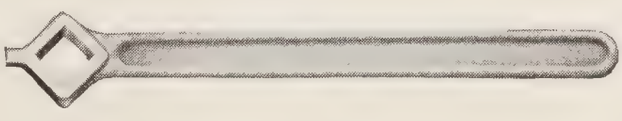
These Cocks are especially adapted for use in operating Hydraulic Presses, hydraulically Operated Gate Valves, etc.

The efficiency and durability of these Cocks, especially under hard and trying service conditions, will be appreciated by all users.

When these Cocks are wanted for steam they will be furnished with iron plugs and are good for steam pressures up to 250 pounds.

For air, a brass plug is furnished and the Cocks are suitable for pressures up to 250 pounds.

WRENCHES



CODE: BROUETTAIT

Size.....Inches	½	¾	1	1¼	1½	2
Size.....Millimeters	13	19	25	32	38	50
Price.....Each	.20	.20	.50	.65	.65	1.00

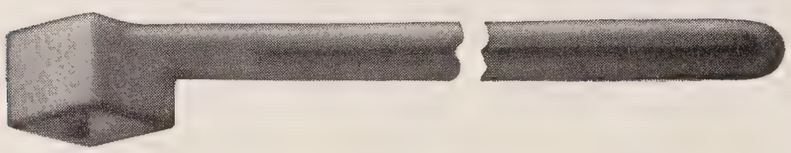
EXTRA HEAVY

ALL-IRON COCKS

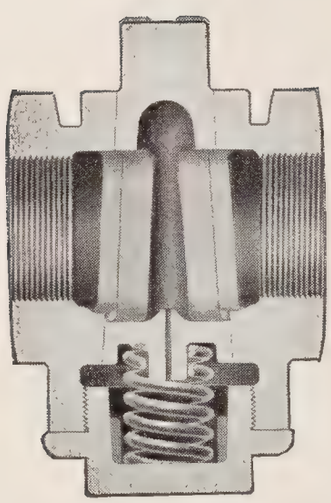
WITH COMPENSATING SPRING

ADAPTED FOR BLOW-OFF LINES

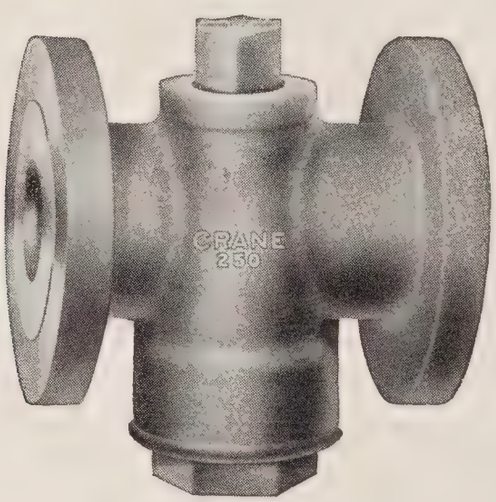
FOR STEAM WORKING PRESSURES UP TO 250 POUNDS



WRENCH
CODE: BRUSQUAIT



No. 316 SCREWED
CODE: BROWALLIA



No. 317 FLANGED
CODE: BRUSCADERA

Size	Inches	1	1¼	1½	2	2½
Size	Millimeters	25	32	38	50	64
No. 316 Screwed (Without Wrench)	Each	5.50	7.00	9.00	11.00	18.00
No. 317 Flanged (Without Wrench)	Each			11.00	13.00	20.00
Wrench	Each	.30	.40	.70	.80	1.00
Face to Face, Flanged	Inches			6½	7½	8½
Diameter of Flanges	Inches			6	6½	7½

The 2½ inch size has Bolted Cap.

Flanged Blow-Off Cocks are always furnished faced only unless otherwise specified.

THE COMPENSATING SPRING

Which is located between the plug and the cap automatically takes up wear and holds the plug securely in place, prolonging the life of the ground bearing surfaces of the plug and body.

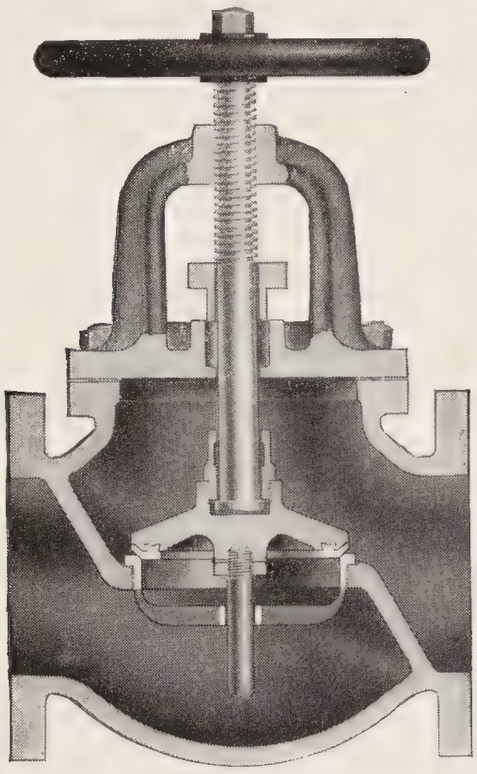
Templates for drilling, page 598. Price List for drilling, page 484.

STANDARD

GLOBE, ANGLE AND CROSS VALVES

IRON BODY WITH YOKE BRASS TRIMMINGS

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS



No. 351. GLOBE VALVE

MERITS OF STANDARD VALVES

THESE VALVES MAY BE RE-PACKED WHILE UNDER PRESSURE: TO DO SO OPEN THE VALVE WIDE UNTIL THE STEM RING FORMS A JOINT BY CONTACT WITH THE LOWER FACE OF BONNET FLANGE.

Our Standard Valves are well proportioned, of good weight, and suitable for steam working pressures up to 125 pounds.

They are tested to 150 pounds hydraulic pressure with the Valve closed, and we have at various times subjected them to a hydraulic pressure, without leaking, as follows:

Size ..... Inches	2 to 5	6 to 8	10 to 12
Tight when closed ..... Pounds	500	250	200
Tight when open ..... Pounds	1000	500	475

but, as stated above, we do not recommend them for more than 125 pounds steam working pressure.

It is not only a question of the Valve standing a higher pressure, but also standing the strain of expansion, contraction, weight of piping and settling, also the cutting effect of the steam on the disc and seat.

Standard Valves are made with brass stem in sizes 6-inch and smaller and with steel stem, nickel-plated, in larger sizes. In the latter Valves the gland flange is made of Malleable Iron, with a brass gland screwed in, which gives additional strength and durability at this point.

The Globe and Angle Valves 2½-inch and larger have a guide on the swivel disc and a bridge on the seat, which insures the square seating of the disc and also prevents the rattling of the disc caused by the pulsation of the steam passsing through a partly open Valve.

Flanged Valves will always be furnished plain faced and not drilled, unless otherwise ordered.

Orders sometimes simply call for Standard Iron Body Valves without specifying the Catalogue Number. In such cases Sizes 2, 2½ and 3 inch will be furnished with a brass Bonnet screwed into body, as shown on Page 103.

STANDARD

GLOBE AND ANGLE VALVES

IRON BODY — BRASS MOUNTED

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS

No. 354. GLOBE
CODE: BRUSTHONIG

No. 356. ANGLE
CODE: BRUTKELLER

Size.....Inches	2	2½	3
Size.....Millimeters	50	64	76
No. 354, Globe, Screwed.....Each	5.40	7.35	9.80
No. 355, Globe, Flanged.....Each	7.00	9.00	12.50
No. 356, Angle, Screwed.....Each	5.40	7.35	9.80
No. 357, Angle, Flanged.....Each	7.00	9.00	12.50

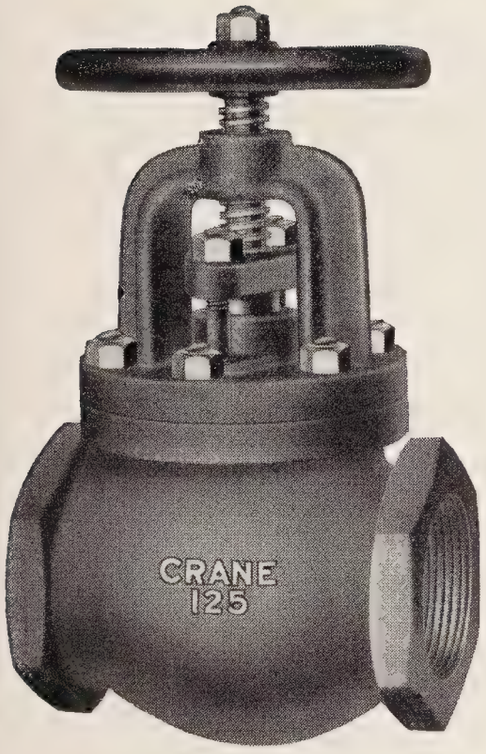
For All-Iron Globe and Angle Valves, see pages 115, 116 and 123.
For general dimensions, see page 601.
Templates for drilling, page 596. Price List for drilling, page 483.

STANDARD

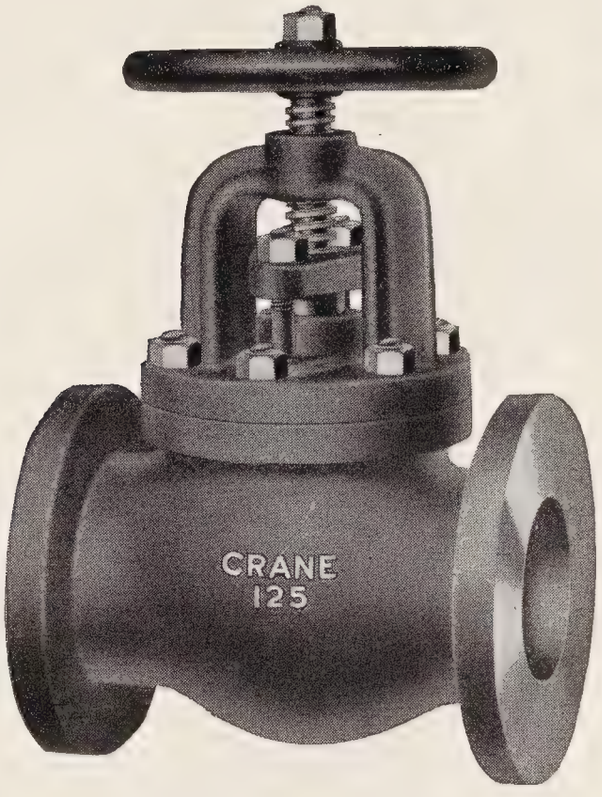
GLOBE VALVES

IRON BODY WITH YOKE BRASS TRIMMINGS

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS



No. 350 SCREWED
CODE: BUDGEROW



No. 351 FLANGED
CODE: BUENPASAR

Size.....Inches	2	2½	3	3½	4	4½	5	6
Size.....Millimeters	50	64	76	90	100	113	125	150
No. 350, Screwed.....Each	7.00	9.00	12.50	15.25	19.00	24.00	27.00	37.50
No. 351, Flanged.....Each	8.60	10.75	15.00	18.50	22.50	27.50	31.00	42.00

Size.....Inches	7	8	10	12	14	16
Size.....Millimeters	175	200	250	300	350	400
No. 350, Screwed.....Each	63.00	72.00	114.00	170.00		
No. 351, Flanged.....Each	68.00	77.00	123.00	187.00	350.00	475.00

Orders sometimes simply call for Standard Iron Body Globe Valves, without specifying any Catalogue Number. In such cases Sizes 2, 2½ and 3 inch will be furnished with a brass Bonnet screwed into the body, as shown on page 114.

All-Iron Valves made to order at a special price.

For general dimensions, see page 601.

Templates for drilling, page 596. Price List for drilling, page 483.

STANDARD

ANGLE VALVES

IRON BODY WITH YOKE BRASS TRIMMINGS

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS

No. 352 SCREWED
CODE: BUIKSNEDE

No. 353 FLANGED
CODE: BUISJESDAG

Size.....Inches	2	2½	3	3½	4	4½	5	6
Size.....Millimeters	50	64	76	90	100	113	125	150
No. 352, Screwed.....Each	7.00	9.00	12.50	15.25	19.00	24.00	27.00	37.50
No. 353, Flanged.....Each	8.60	10.75	15.00	18.50	22.50	27.50	31.00	42.00
Size.....Inches	7	8	10	12	14	16		
Size.....Millimeters	175	200	250	300	350	400		
No. 352, Screwed.....Each	63.00	72.00	114.00	170.00				
No. 353, Flanged.....Each	68.00	77.00	123.00	187.00	350.00	475.00		

Orders sometimes simply call for Standard Iron Body Angle Valves without specifying Catalogue Number. In such cases sizes 2, 2½ and 3 inch will be furnished with a brass bonnet screwed into the body, as shown on page 114.

All-Iron Valves made to order at a special price.

For general dimensions, see page 601.

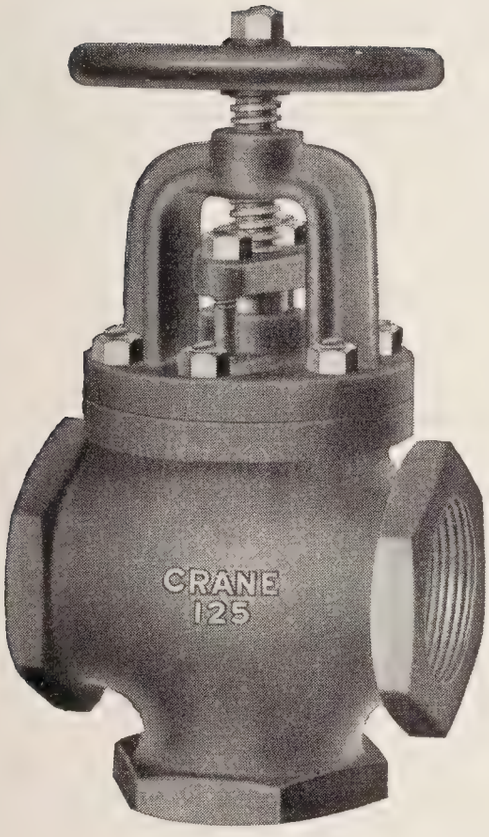
Templates for drilling, page 596. Price List for drilling, page 483.

STANDARD

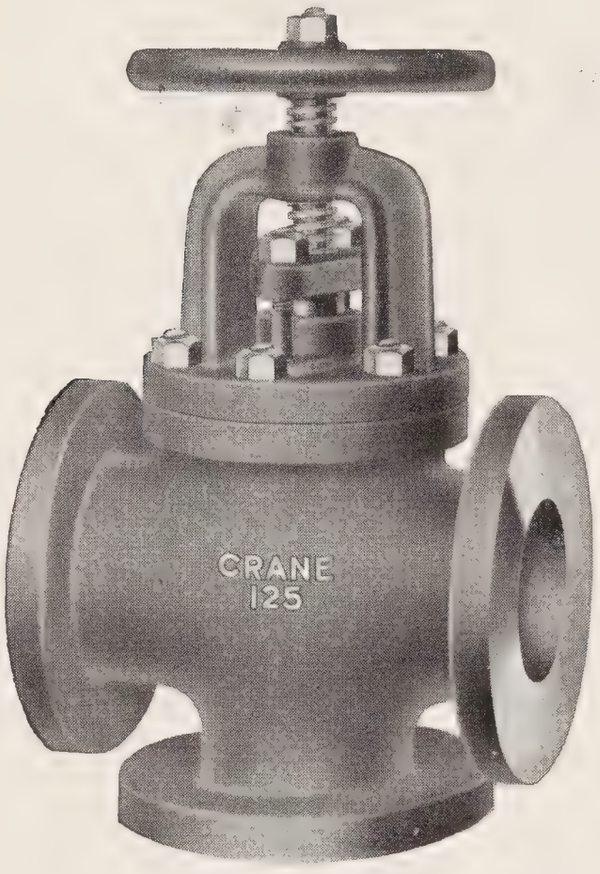
CROSS VALVES

IRON BODY WITH YOKE BRASS TRIMMINGS

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS



No. 362 SCREWED
CODE: BUNTKEHLIG



No. 363 FLANGED
CODE: BUPRASIUM

Size.....Inches	2	2½	3	3½	4	4½
Size.....Millimeters	50	64	76	90	100	113
No. 362, Screwed.....Each	8.50	11.75	16.25	20.00	23.50	30.65
No. 363, Flanged.....Each	11.00	14.50	20.00	25.00	28.50	36.00
Size.....Inches	5	6	7	8	10	12
Size.....Millimeters	125	150	175	200	250	300
No. 362, Screwed.....Each	35.25	47.25	78.00	92.00	162.00	240.00
No. 363, Flanged.....Each	41.00	54.00	85.00	100.00	175.00	265.00

For general dimensions, see page 601.

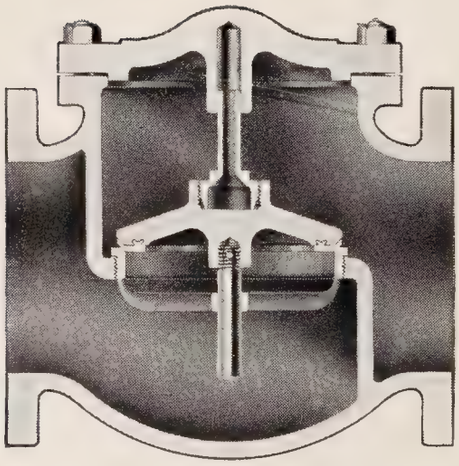
Templates for drilling, page 596. Price list for drilling, page 483.

STANDARD

HORIZONTAL AND VERTICAL CHECK VALVES

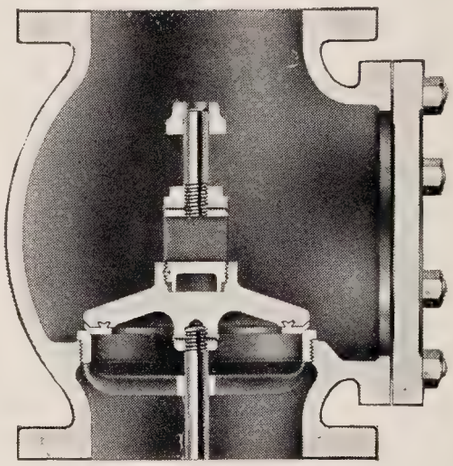
IRON BODY BRASS TRIMMINGS

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS



No. 367, HORIZONTAL

CODE: BURGRAVIAT



No. 369, VERTICAL

CODE: BURSALOGIA

HORIZONTAL CHECK VALVES

Size.....Inches	*2	*2½	*3	3½	4	4½	5	6
Size.....Millimeters	50	64	76	90	100	113	125	150
No. 366, Screwed.Each	3.60	6.50	8.90	12.25	14.25	19.00	22.00	30.00
No. 367, Flanged.Each			11.50		18.00		26.00	35.00
Size.....Inches	7	8	10	12	14			
Size.....Millimeters	175	200	250	300	350			
No. 367, Flanged.Each	50.00	62.00	115.00	175.00	300.00			

VERTICAL CHECK VALVES

Size.....Inches	2½	3	3½	4	4½
Size.....Millimeters	64	76	90	100	113
No. 368, Screwed.....Each	9.50	12.50	17.00	21.00	30.00
Size.....Inches	5	6	7	8	10
Size.....Millimeters	125	150	175	200	250
No. 368, Screwed.....Each	33.00	40.00			
No. 369, Flanged.....Each		45.00	67.00	78.00	135.00

***HORIZONTAL CHECKS,** sizes 3-inch and smaller are furnished with a brass cap, which is screwed into the body. Sizes 3½-inch and larger are furnished with an iron cap bolted to the body.

VERTICAL CHECK Valves are furnished in all sizes with bolted cap.

Larger sizes made to order at a special price.

For general dimensions, see page 611.

Templates for drilling, see page 596. Price List for drilling, page 483.

STANDARD

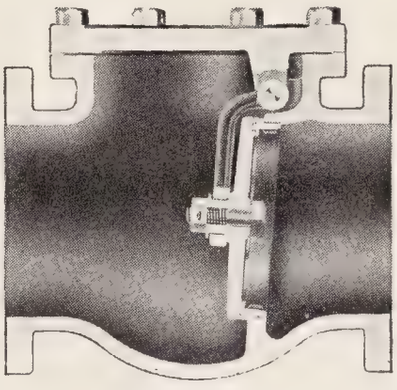
SWING CHECK VALVES

IRON BODY WITH BRASS OR LEATHER FACED DISC BRASS SEAT

FOR STEAM WORKING PRESSURES, SIZES 16 INCH AND SMALLER, UP TO 125 POUNDS
ABOVE 16 INCH UP TO 100 POUNDS

FOR WATER WORKING PRESSURES, SEE PAGE 1

No. 372 SCREWED
CODE: BUVERAGE



No. 373 FLANGED
CODE: CABRUDO

MAY BE USED IN HORIZONTAL POSITION OR FOR UPWARD FLOW

Size.....Inches	*2	*2½	*3	3½	4	4½	5
Size.....Millimeters	50	64	76	90	100	113	125
No. 372, Screwed, with Brass Faced Disc.....Each	11.00	12.00	13.50	17.50	20.00	26.00	30.00
No. 373, Flanged, with Brass Faced Disc.....Each	13.00	14.50	17.00	21.00	24.00	30.00	34.00
Add for Leather Faced Disc....Each	1.00	1.50	2.00	2.50	3.00	3.50	4.00

Size.....Inches	6	7	8	10	12	14
Size.....Millimeters	150	175	200	250	300	350
No. 372, Screwed, with Brass Faced Disc....Each	36.00	55.00	70.00	110.00	160.00	
No. 373, Flanged, with Brass Faced Disc....Each	41.00	60.00	75.00	115.00	168.00	340.00
Add for Leather Faced Disc...Each	4.00	6.00	7.50	10.00	12.00	

Size.....Inches		16	18	20	24	30
Size.....Millimeters		400	450	500	600	750
No. 373, Flanged, with Brass Faced Disc....Each		450.00	600.00	700.00	1000.00	1650.00

Swing Check Valves, for COLD Water, preferably should have leather faced discs. For HOT WATER OR STEAM, brass or brass faced discs should be used. Unless otherwise specified on order, Swing Check Valves will be furnished with solid brass or brass faced discs.

*Sizes 3-inch and smaller have solid brass discs; larger sizes have iron discs with brass faces.

Valves made to order with By-Pass. Prices on application.

For general dimensions, see page 611.

Templates for drilling, page 596. Price List for drilling, page 483.

STANDARD

SWING CHECK VALVES

WITH LEATHER FACED DISC

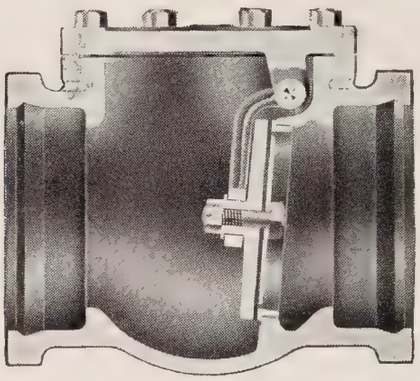
IRON BODY — HUB ENDS — BRASS SEAT

FOR WATER WORKING PRESSURES:

SIZES 12-INCH AND SMALLER, UP TO 175 POUNDS

SIZES 14 AND 16-INCH, UP TO 150 POUNDS

SIZES 18-INCH AND LARGER, UP TO 120 POUNDS



No. 374 HUB

CODE: CAHIMENTO

MAY BE USED IN HORIZONTAL POSITION OR FOR UPWARD FLOW

Size....Inches	3	4	5		
Size....Millimeters	76	100	125		
No. 374, Hub, with Leather Faced Disc....Each	19.00	27.00	38.00		
Size....Inches	6	8	10	12	14
Size....Millimeters	150	200	250	300	350
No. 374, Hub, with Leather Faced Disc. Each	45.00	82.50	125.00	185.00	340.00
Size....Inches	16	18	20	24	
Size....Millimeters	400	450	500	600	
No. 374, Hub, with Leather Faced Disc. Each	450.00	600.00	700.00	1000.00	

These Valves are suitable for use with Cast Iron or Wood Pipe—however, where diameters of hubs given in table, page 611, are not suitable, the required diameters will be furnished on valves at a special price.

Hubs are usually furnished rough—if bored hubs are required orders should so specify.

Valves with By-Pass made to order. Prices on application.

For general dimensions, see page 611.

STANDARD

GLOBE AND ANGLE VALVES

CRANE RENEWABLE DISC

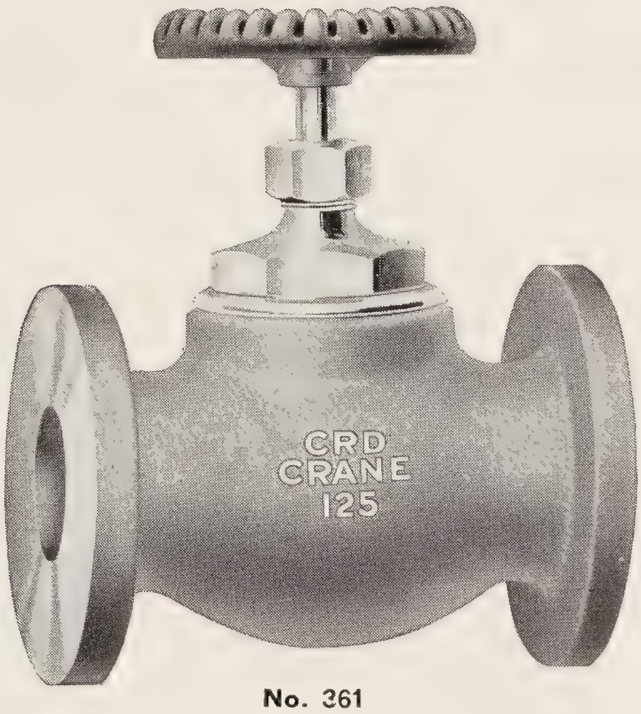
IRON BODY **WITH BRASS SCREWED BONNET** **BRASS MOUNTED**

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS

No. 360

SCREWED, GLOBE

CODE: CAJANTIBUS



No. 361

FLANGED, GLOBE

CODE: CALAMEGGIA

Size.....Inches	2	2½	3
Size.....Millimeters	50	64	76
No. 360, Globe or Angle, Screwed.....Each	7.25	11.00	16.00
No. 361, Globe or Angle, Flanged.....Each	8.50	13.00	18.00

When ordering state whether Globe or Angle Valve is wanted.

These Valves are fitted with Crane Steam Discs, suitable for use on saturated steam pressures up to 125 pounds.

When wanted for compressed air or cold water service, Crane Cold Water Discs will be furnished. For hot water service, Crane Hot Water Discs will be furnished. Crane Steam Discs will always be furnished unless otherwise specified.

For general dimensions, see page 603.

Templates for drilling page 596. Price list for drilling page 483.

EXTRA CRANE RENEWABLE DISCS

CODE: CALDOUACH

Size.....Inches	2	2½	3	3½	4	4½	5	6	7	8	10	12
Size...Millimeters	50	64	76	90	100	113	125	150	175	200	250	300
Steam.....Each	.36	.48	.80	1.00	1.20	1.40	1.60	2.00	2.40	2.80	4.50	5.00
Cold Water..Each	.36	.48	.80	1.00	1.20	1.40	1.60	2.00	2.40	2.80	4.50	5.00
Hot Water...Each	.36	.48	.80	1.00	1.20	1.40	1.60	2.00	2.40	2.80	4.50	5.00

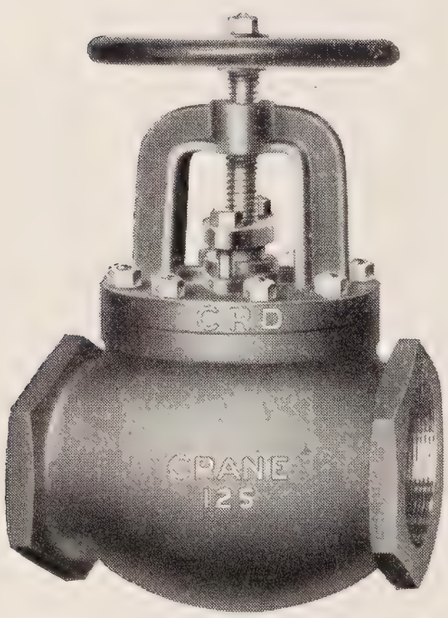
STANDARD

GLOBE AND ANGLE VALVES

CRANE RENEWABLE DISC

IRON BODY **WITH YOKE** **BRASS TRIMMINGS**

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS



No. 358. GLOBE
CODE: CAMPENSEM

No. 359. GLOBE
CODE: CANTIMARON

Size.....Inches	2½	3	3½	4	4½	5
Size.....Millimeters	64	76	90	100	113	125
No. 358, Globe or Angle, Screwed.....Each	12.00	16.75	19.50	24.00	32.00	40.00
No. 359, Globe or Angle, Flanged.....Each	14.00	18.50	21.50	26.00	34.00	42.00

Size.....Inches	6	7	8	10	12	
Size.....Millimeters	150	175	200	250	300	
No. 358, Globe or Angle, Screwed.....Each	48.00	80.00	90.00	130.00	185.00	
No. 359, Globe or Angle, Flanged.....Each	50.00	80.00	90.00	130 00	185 00	

Valves 7 inch and larger have steel stem, plated; smaller sizes, brass stem.

In ordering, specify whether Globe or Angle Valves are wanted, otherwise Globe Valves will be furnished.

These Valves are fitted with Crane Steam Renewable Discs, suitable for use on saturated steam pressures up to 125 pounds.

When wanted for compressed air or cold water service, Crane Cold Water Discs will be furnished. For hot water service, Crane Hot Water Discs will be furnished. Crane Steam Discs will always be furnished unless otherwise specified.

For general dimensions, see page 603.

Templates for drilling, page 596. Price List for drilling, page 483.

For extra Crane Renewable Discs. see page 121.

UNION BONNET

GLOBE, ANGLE AND CHECK VALVES

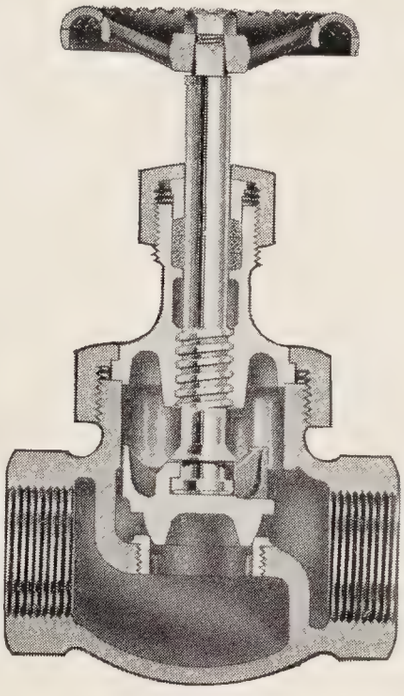
IRON BODY — **NICALLOY SEAT AND DISC**

MALLEABLE IRON { WHEEL, STUFFING BOX NUT, BONNET RING } **BRASS** { STEM, STUFFING BOX GLAND, BONNET }

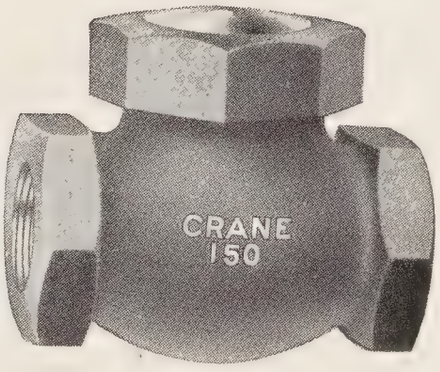
FOR STEAM WORKING PRESSURES UP TO 150 POUNDS

No. 350½

CODE: CARDEALADO



SECTION



No. 366½

CODE: CARMENARLE

Size.....Inches	⅜	½	¾	1	1¼	1½	2
Size.....Millimeters	10	13	19	25	32	38	50
No. 350½ Globe, Screwed.....Each	1.25	1.60	2.20	2.80	4.00	5.50	8.75
No. 352½ Angle, Screwed.....Each	1.25	1.60	2.20	2.80	4.00	5.50	8.75
No. 366½ Horiz. Check, Screwed.....Each	....	1.30	1.90	2.60	3.60	5.00	7.50
No. 367½ Angle Check, Screwed.....Each	....	1.30	1.90	2.60	3.60	5.00	7.50

These Valves have Renewable Discs and Seat Rings of Nicalloy (special nickel alloy) for use on steam, oil or caustic soda and for throttling purposes.

The Iron Body Valves are made also with Crane Renewable Discs for use in service where quick repairs are desired. Discs for Steam, Air or Water will be furnished as ordered. See page 17 for price of Renewable Discs.

ALL-IRON GLOBE AND ANGLE VALVES

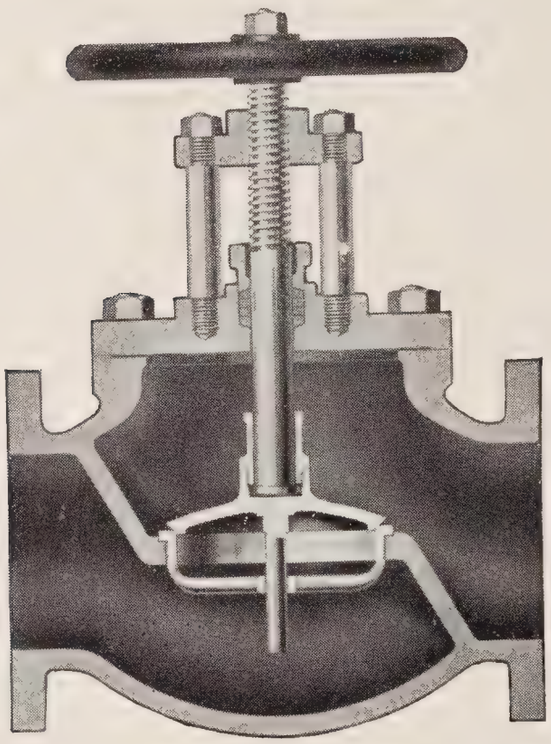
Size.....Inches	⅜	½	¾	1	1¼	1½	2
Size.....Millimeters	10	13	19	25	32	38	50
No. 354½ Globe, Screwed.....Each	1.25	1.60	2.20	2.80	4.00	5.50	8.75
No. 356½ Angle, Screwed.....Each	1.25	1.60	2.20	2.80	4.00	5.50	8.75

All-Iron Valves are made for use with fluids which destroy brass, bronze or nickel alloys.

For general dimensions see page 610.

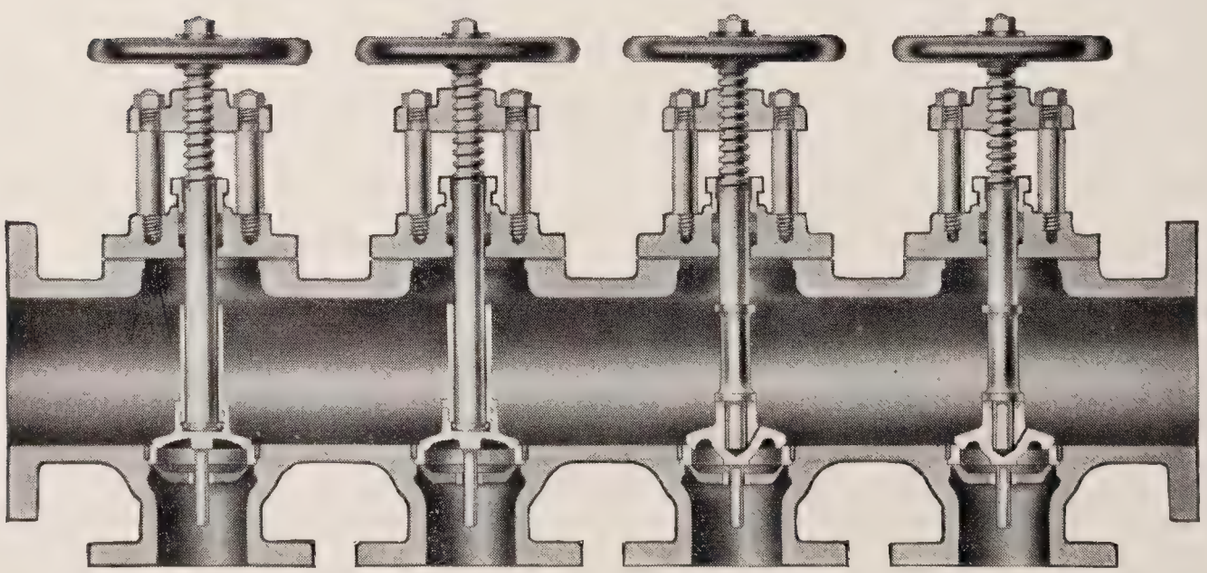
STANDARD
IRON BODY VALVES

TRIMMED FOR
MARINE REQUIREMENTS



GLOBE STOP. ALSO, ANGLE CROSS AND SCREW DOWN CHECK VALVES

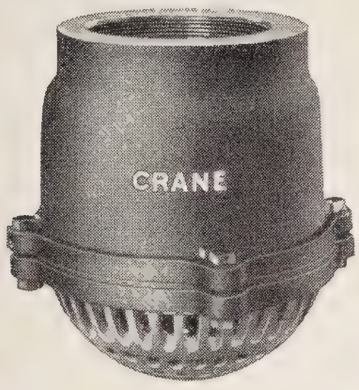
MANIFOLD VALVES



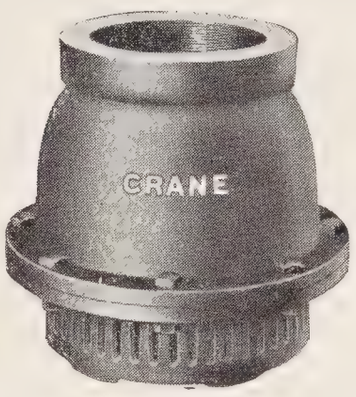
WE HAVE MANY PATTERNS AND DESIGNS OF MANIFOLD VALVES. PRICES AND INFORMATION ON APPLICATION.

FOOT VALVES

IRON BODY — LEATHER DISC — WITH STRAINER



STYLE SIZES ¾ INCH TO 6 INCH



STYLE SIZES 7 INCH TO 16 INCH

No. 394. SCREWED
CODE: CAROLYTIC

No. 395. FLANGED
CODE: CASUMNIAR

Size	Size Millimeters	Price No. 394, Screwed	Price No. 394, Galvanized	Price No. 395, Flanged	Price No. 395, Galvaniz'd	Largest O. D. No. 394	Total Height No. 394	Largest O. D. No. 395	Total Height No. 395	Diameter Flan's
Inches		Each	Each	Each	Each	Inches	Inches	Inches	Inches	Inches
¾	19	1.15	1.75			3¾	3¾			
1	25	1.30	2.00			3¾	3¾			
1¼	32	1.40	2.10			4⅛	4¼			
1½	38	1.90	2.85			4¾	4¾			
2	50	2.40	3.60	3.50	5.50	5½	5⅝	6	5¾	6
2½	64	3.30	5.00	4.50	7.00	6¼	6⅜	7	6⅝	7
3	76	3.90	5.75	5.75	9.00	7	7⅛	7½	7⅜	7½
3½	90	5.60	8.50	7.50	12.00	8⅞	9¼	8⅞	9⅝	8½
4	100	7.30	11.00	9.50	15.00	8⅞	9¼	9	9⅝	9
4½	113	10.50	15.75	13.00	20.00	10½	11¼	10½	12	9¼
5	125	11.25	16.75	14.00	22.00	10½	11¼	10½	12	10
6	150	14.75	22.00	17.50	27.00	11¾	12¼	11¾	13¼	11
7	175	35.00	53.00	38.00	57.00	13⅛	10¾	13⅛	11⅜	12½
8	200	41.00	62.00	45.00	72.00	15¼	12½	15¼	13½	13½
10	250	64.00	110.00	70.00	120.00	19⅝	19	19⅝	19	16
12	300	100.00	155.00	112.00	170.00	20¼	17	20¼	18¼	19
14	350			150.00				24⅛	19¾	21
15	375			175.00				25¼	22	22¼
16	400			200.00				27	24½	23½

These Valves, as constructed, insure free openings.
Can be furnished with Brass Disc in place of Leather Disc, see page 126.
All Brass Foot Valves, with Strainer, page 8.
Templates for drilling, page 596. Price List for drilling, page 483.
For Hard Service, Centrifugal Pumps and high pressures, No. 373 Swing Check Valves with Strainers and Leather Faced Discs can be supplied and are recommended.
For service on Hot Water, our No. 394½ and No. 395½ Foot Valves with Brass Disc should be specified. See page 126.

FOOT VALVES

IRON BODY **WITH STRAINER**

BRASS SEAT RING **BRASS DISC**

STYLE, SIZES 2 INCH TO 6 INCH

STYLE, SIZES 7 AND 8 INCH

No. 394½ SCREWED
CODE: CELLICOLE

No. 395½ FLANGED
CODE: CELSITUDE

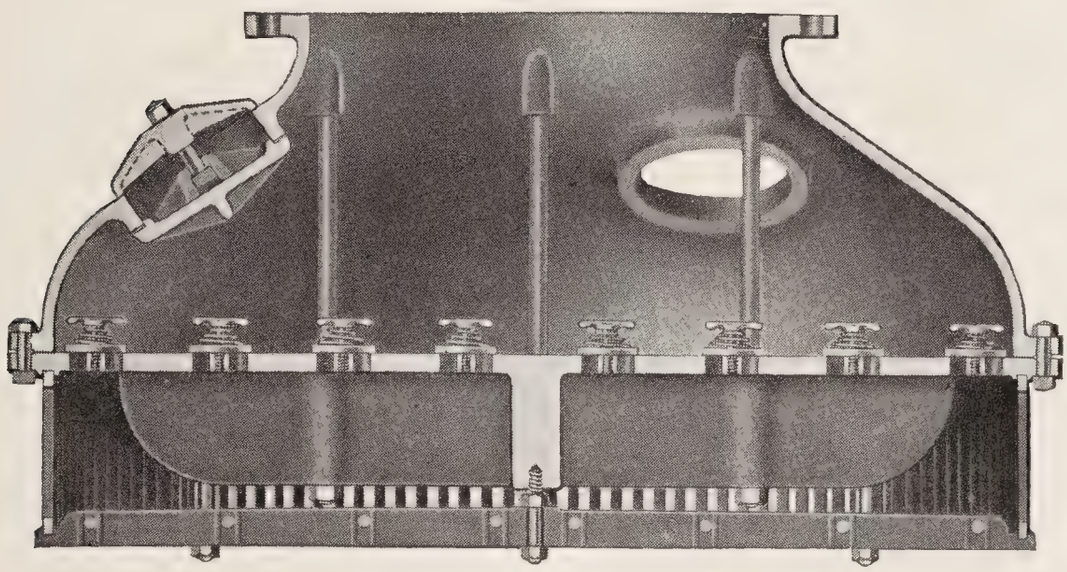
Size Inches	Size Millimeters	Price No. 394½ Screwed Each	Price No. 395½ Flanged Each	Largest O. D. No. 394½ Inches	Total Height No. 394½ Inches	Largest O. D. No. 395½ Inches	Total Height No. 395½ Inches	Diam. Flanges Inches
1¼	32	8.00		3¾	4⅛			
1½	38	9.00		4⅛	4¾			
2	50	10.00		5½	5⅝	6	5¾	6
2½	64	11.00		6¼	6⅜	7	6⅝	7
3	76	12.00	13.00	7	7⅛	7½	7⅜	7½
3½	90	13.00	14.00	8⅞	9¼	8⅞	9⅝	8½
4	100	14.00	15.00	8⅞	9¼	9	9⅝	9
5	125	15.00	16.00	10½	11¼	10½	12	10
6	150	18.00	20.00	11¾	12¼	11¾	13¼	11
7	175	35.00	37.00	13⅛	10¾	13⅛	11⅜	12½
8	200	45.00	48.00	15¼	12½	15¼	13½	13½
10	250	80.00	85.00	18	15⅛	18	16⅛	16

These Valves are recommended for Hot Water.
These Valves are not carried in stock.
All Brass Foot Valves, with Strainer, page 8.
Templates for drilling, page 596. Price List for drilling, page 483.

FOOT VALVES

IRON BODY WITH MULTIPLE RUBBER DISCS

CAST IRON STRAINER BRONZE SPRINGS



No. 397. FLANGED

CODE: CENTIFOLIA

Size.....Inches	16	18	20	24	30	36
Size.....Millimeters	400	450	500	600	750	900
Price.....Each	190.00	235.00	265.00	400.00	780.00	1200.00

[1]Valves with Brass Seats will be made to order at a special price.

DIMENSIONS

Size.....Inches	16	18	20	24	30	36
Size.....Millimeters	400	450	500	600	750	900
Diameter of Flanges.....Inches	23½	25	27½	32	38¾	46
Greatest Diameter.....Inches	34¾	40¾	46	54½	69½	82
Height.....Inches	18½	23	24¾	30	36	39¾
Thickness of Flange.....Inches	1 3/16	1¼	1⅜	1 9/16	1¾	1⅞

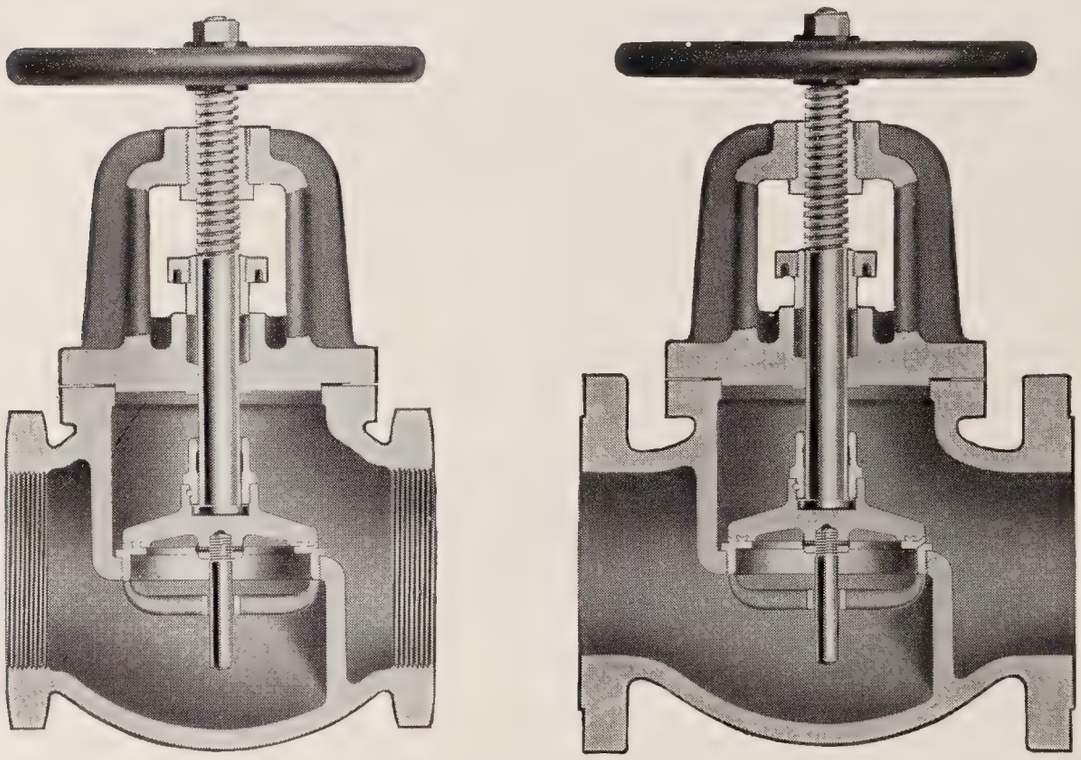
Templates for drilling, page 596. Price List for drilling, page 483.

MEDIUM

GLOBE, ANGLE AND CROSS VALVES

FERROSTEEL BODY WITH YOKE CRANE SPECIAL BRASS SEATS

FOR STEAM WORKING PRESSURES UP TO 175 POUNDS



No. 341. GLOBE VALVE

The body of these Valves, all sizes, is made of Ferrosteel. The Yoke is made of Ferrosteel in sizes 8 inch and larger. In Medium Valves, sizes 2 to 5 inch the Stem is made of Crane Stem Metal and in the larger sizes of Steel, plated.

The gland flange on all Valves having a steel stem is made of Malleable Iron with a brass gland screwed in, which gives additional strength and durability to these parts.

These Valves may be repacked while under pressure; to do so open the Valve wide until the stem ring forms a joint by contact with the lower face of the bonnet flange.

Unless otherwise specified, we will always furnish our Extra Heavy and Medium Flanged Valves, also our Extra Heavy Companion Flanges and Flanged Fittings, with $\frac{1}{16}$ inch raised face, for which we make no extra charge.

This style of facing will hold any gasket, and is especially necessary where a thin corrugated copper gasket is used, as this gasket draws down to $\frac{1}{32}$ inch or less and the heavy bolting would (without the raised face) spring the flanges until the edges touch, without putting sufficient pressure upon the gasket.

The Merits of Crane Ferrosteel are described on page 2.

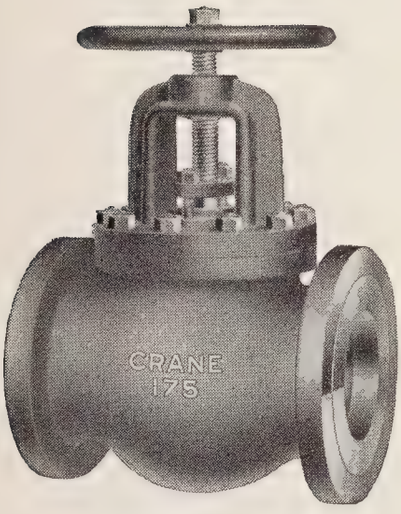
MEDIUM

GLOBE AND ANGLE VALVES

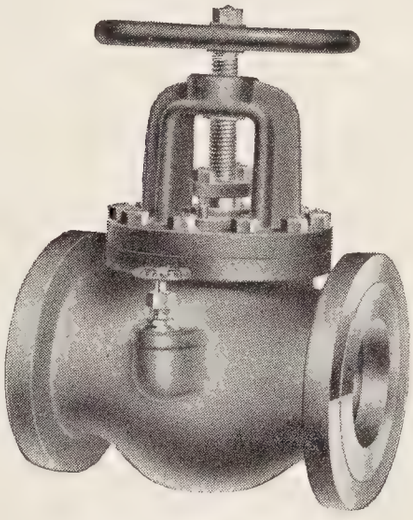
WITH YOKE

FERROSTEEL BODY — CRANE SPECIAL BRASS SEATS

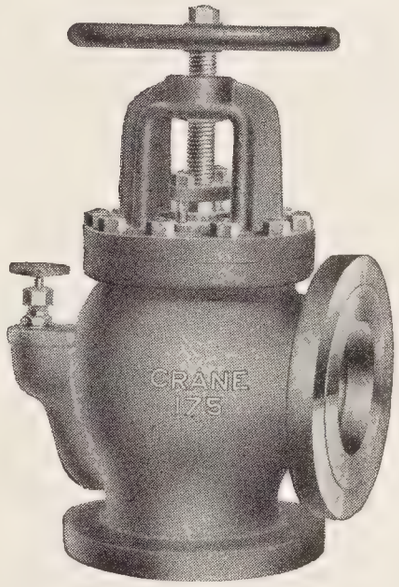
FOR STEAM WORKING PRESSURES UP TO 175 POUNDS



No. 341 GLOBE
CODE: CEPEAUX



No. 341 B. P. GLOBE
CODE: CERMENAL



No. 343 B. P. ANGLE
CODE: CERTISSIMA

No. 343 WITHOUT BY-PASS
CODE: CERNUAREM

Size.....Inches	2	2½	3	3½	4	4½
Size.....Millimeters	50	64	76	90	100	113
No. 340, Screwed Globe.....Each	13.00	16.00	20.00	24.00	28.00	35.00
No. 341, Flanged Globe.....Each	15.00	18.00	23.00	28.00	33.00	40.00
No. 342, Screwed Angle.....Each	13.00	16.00	20.00	24.00	28.00	35.00
No. 343, Flanged Angle.....Each	15.00	18.00	23.00	28.00	33.00	40.00

Size.....Inches	5	6	7	8	10	12
Size.....Millimeters	125	150	175	200	250	300
No. 340, Screwed Globe.....Each	42.00	50.00	80.00	90.00	135.00	190.00
No. 341, Flanged Globe.....Each	47.00	55.00	85.00	95.00	145.00	200.00
No. 341 B. P., Flanged Globe with By-Pass.Each		85.00	115.00	125.00	195.00	250.00
No. 342, Screwed Angle.....Each	42.00	50.00	80.00	90.00	135.00	190.00
No. 343, Flanged Angle.....Each	47.00	55.00	85.00	95.00	145.00	200.00
No. 343 B. P., Flanged Angle with By-Pass.Each		85.00	115.00	125.00	195.00	250.00

On installations larger than 6 inches we recommend that Flanged Valves be used.

The By-Pass on Globe Valves is located on the right hand side looking at the inlet end, which is, the end with the passage under the disc.

The By-Pass on Angle Valves is located on the back, that is, opposite the outlet.

It is desirable that all Valves 6 inches and larger have a By-Pass.

In ordering, always specify the style number of Valve wanted.

For general dimensions, see page 605.

Templates for drilling, page 598. Price List for drilling, page 484.

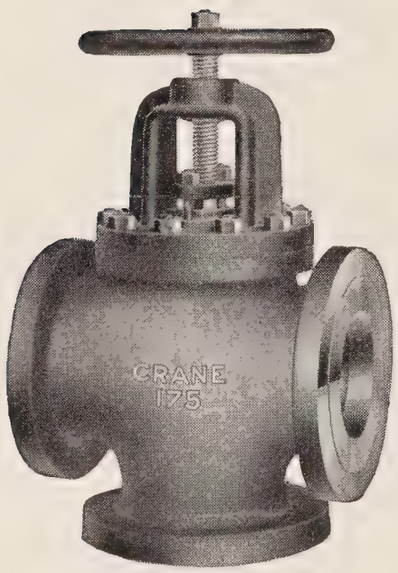
MEDIUM

CROSS VALVES

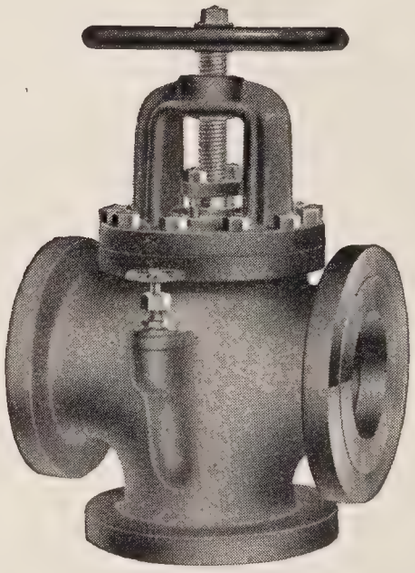
WITH YOKE

FERROSTEEL BODY **CRANE SPECIAL BRASS SEATS**

FOR STEAM WORKING PRESSURES UP TO 175 POUNDS



No. 345
CODE: CERVEQUE



No. 345 B. P.
CODE: CESTINASTI

Size	Inches	2½	3	3½	4	4½	5
Size	Millimeters	64	76	90	100	113	125
No. 344, Screwed	Each	22.00	27.00	32.00	37.00	45.00	54.00
No. 345, Flanged	Each	25.00	31.00	37.00	43.00	52.00	60.00
Size	Inches	6	7	8	10	12	
Size	Millimeters	150	175	200	250	300	
No. 344, Screwed	Each	65.00	100.00	115.00	185.00	260.00	
No. 345, Flanged	Each	72.00	107.00	122.00	195.00	275.00	
No. 345 BP, Flanged, with By-Pass	Each	102.00	137.00	152.00	245.00	325.00	

On installations larger than 6 inches we recommend that Flanged Valves be used.

It is desirable that all Valves 6 inches and larger have a By-Pass.

In ordering, always specify the style number of Valve wanted.

For general dimensions, see page 605.

Templates for drilling, page 598. Price List for drilling, page 484.

EXTRA HEAVY

GLOBE, ANGLE AND CROSS VALVES

FERROSTEEL WITH YOKE HARD METAL SEATS

FOR SATURATED STEAM WORKING PRESSURES UP TO 250 POUNDS

FOR SUPERHEATED STEAM WORKING PRESSURES UP TO 250 POUNDS AND A TOTAL TEMPERATURE NOT TO EXCEED 500 DEGREES FAHR.

These Valves are tested to 800 pounds hydraulic pressure per square inch with Valve open, and are also tested with the Valve closed and the pressure under the disc to 300 pounds hydraulic pressure. We have at various times subjected them to a hydraulic pressure with the Valve closed and the pressure under the disc as follows:

Size:	2½ to 3 inch.	4 to 5 inch.	6 inch.	8 to 10 inch.
Tight at:	1500 pounds	1200 pounds	800 pounds	500 pounds

It will be noted that some sizes of these valves will not stand the full pressure of 800 pounds under the discs. This we consider unnecessary, as there are never any unusual strains affecting this part of the Valve.

BURSTING PRESSURES

The Bodies and Yokes on Extra Heavy Globe, Angle and Cross Valves are made of Ferrosteel, and the actual hydraulic pressure required to burst them is:
Sizes 4 to 6 inches.....3200 to 4000 pounds per square inch
Size 10 inch.....1550 to 1800 pounds per square inch

In setting the working pressure at 250 pounds per square inch, we have used a factor of safety conservatively high. However, it is not a question of pressure alone, but the Valves must stand without distortion, the strains incident to expansion and contraction, settling of pipe lines and a possible moderate water hammer.

CONSTRUCTION

The bodies of these Valves are very heavy, and have large and free openings.

The seat in the body is made extra heavy of hard metal, and has our Improved Bridge to guide the swivel disc.

The swivel disc is made with a guide. Sizes up to 3½ inch are made extra heavy of solid hard metal. The larger sizes, 4 inch and upward, are made very heavy of Cast Iron, with hard metal facing, thereby making the disc very rigid.

The combination of the guide on the disc and the bridge on the seat ensures the square seating of the disc, and also prevents the rattling of the disc caused by the pulsation of the steam passing through a partly open Valve.

The likelihood of the seat and disc in a Valve subjected to extreme steam pressure being cut or wire-drawn, makes it necessary to use the very best metal that can be made for these parts.

Hard Metal is the very best material that can be made to stand the wear which the seats of these Valves are subjected to.

If desired we can furnish these Valves with the Crane Removable Copper Disc at a special price.

These Valves are fitted with our Improved Stem Ring, which enables the Valves to be packed when open without steam escaping.

The stem in all sizes is made of Steel and plated, and the Gland Flange is made of Malleable Iron, with a brass Gland screwed in, which gives strength and durability to these parts.

The Hand Wheel is very large to enable the operator to get a good leverage when closing the Valve.

EXTRA HEAVY

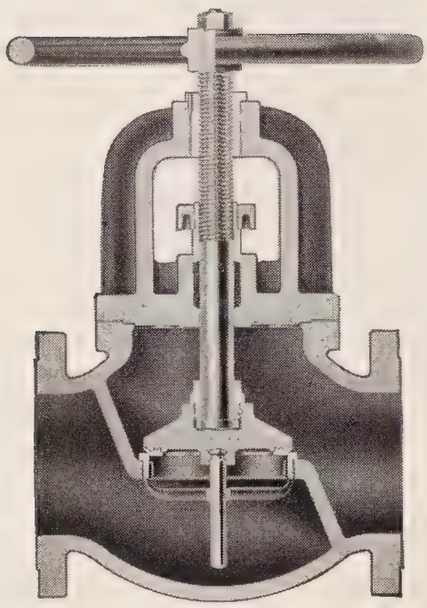
GLOBE, ANGLE AND CROSS VALVES

FERROSTEEL WITH YOKE HARD METAL (BRONZE) SEATS

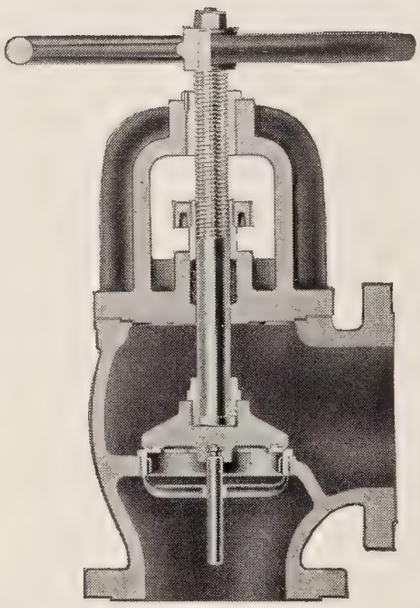
FOR SATURATED STEAM WORKING PRESSURES UP TO 250 POUNDS

FOR SUPERHEATED STEAM WORKING PRESSURES, UP TO 250 POUNDS AND A TOTAL TEMPERATURE NOT TO EXCEED 500 DEGREES FAHR.

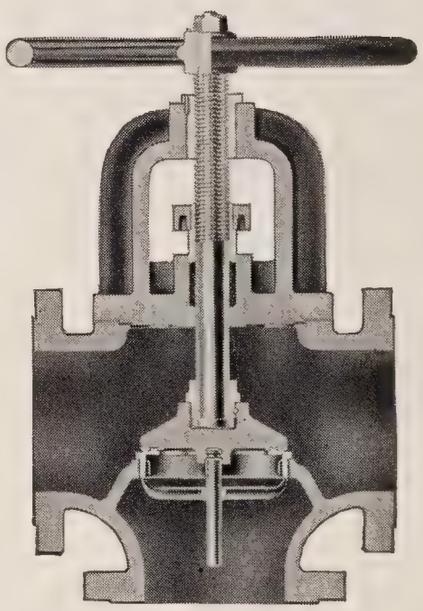
TESTED TO 800 POUNDS HYDRAULIC PRESSURE PER SQUARE INCH



No. 21 E, GLOBE



No. 23 E, ANGLE



No. 25 E, CROSS

THESE VALVES MAY BE PACKED WHILE UNDER PRESSURE; TO DO SO, OPEN THE VALVE WIDE UNTIL THE STEM RING FORMS A JOINT BY CONTACT WITH THE LOWER FACE OF THE BONNET FLANGE.

Unless otherwise specified, we will always furnish our Extra Heavy and Medium Flanged Valves, also our Extra Heavy Companion Flanges and Flanged Fittings, with $\frac{1}{16}$ inch raised face, for which we make no extra charge. This style of facing will hold any gasket, and is especially necessary where a thin corrugated copper gasket is used. This gasket draws down to $\frac{1}{32}$ inch or less and the heavy bolting would otherwise spring the flanges until the edges touch, without putting sufficient pressure upon the gasket.

EXTRA HEAVY

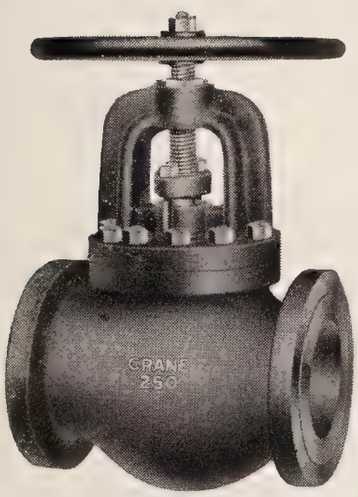
GLOBE AND ANGLE VALVES

FERROSTEEL WITH YOKE HARD METAL (BRONZE) SEATS

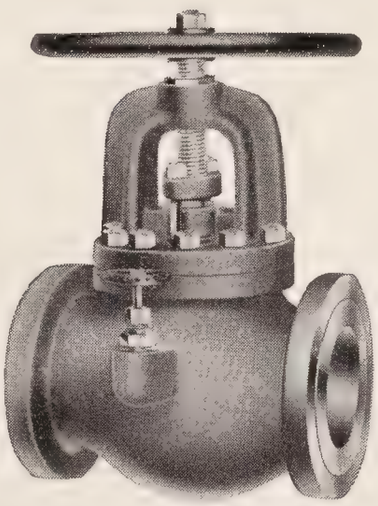
FOR SATURATED STEAM WORKING PRESSURES UP TO 250 POUNDS

FOR SUPERHEATED STEAM WORKING PRESSURES UP TO 250 POUNDS AND A TOTAL TEMPERATURE NOT TO EXCEED 500 DEGREES FAHR.

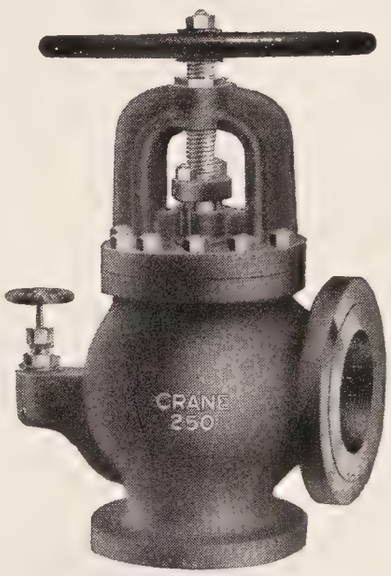
TESTED TO 800 POUNDS HYDRAULIC PRESSURE PER SQUARE INCH



No. 21 E, GLOBE WITHOUT BY-PASS
CODE: CETOLOGIA



No. 27 E, GLOBE WITH BY-PASS
CODE: CHAFAROTES



No. 29 E, ANGLE WITH BY-PASS
CODE: CHANGOTES

No. 23 E, ANGLE WITHOUT BY-PASS
CODE: CHABOUK

Size.....Inches	2	2½	3	3½	4	4½
Size.....Millimeters	50	64	76	90	100	113
No. 20 E, Screwed Globe.....Each	26.00	33.00	37.00	42.00	46.00	56.00
No. 21 E, Flanged Globe.....Each	27.50	35.00	40.00	45.00	50.00	60.00
No. 22 E, Screwed Angle.....Each	26.00	33.00	37.00	42.00	46.00	56.00
No. 23 E, Flanged Angle.....Each	27.50	35.00	40.00	45.00	50.00	60.00

Size.....Inches	5	6	7	8	10	
Size.....Millimeters	125	150	175	200	250	
No. 20 E, Screwed Globe.....Each	61.00	75.00				
No. 21 E, Flanged Globe.....Each	65.00	80.00	100.00	120.00	200.00	
No. 22 E, Screwed Angle.....Each	61.00	75.00				
No. 23 E, Flanged Angle.....Each	65.00	80.00	100.00	120.00	200.00	
No. 27 E, Flanged Globe with By-Pass ....Each		110.00	130.00	150.00	250.00	
No. 29 E, Flanged Angle with By-Pass ....Each		110.00	130.00	150.00	250.00	

On installations larger than 6 inches we recommend that Flanged Valves be used.

The By-Pass on Globe Valves is located on the right hand side looking at the inlet end, which is the end with the passage under the disc.

The By-Pass on Angle Valves is located on the back, that is, opposite the outlet.

It is desirable that all valves, 6 inch and larger, have a By-Pass.

In ordering, always specify the style number of valve wanted.

For general dimensions, see page 607.

Templates for drilling, page 598. Price List for drilling, page 484.

EXTRA HEAVY

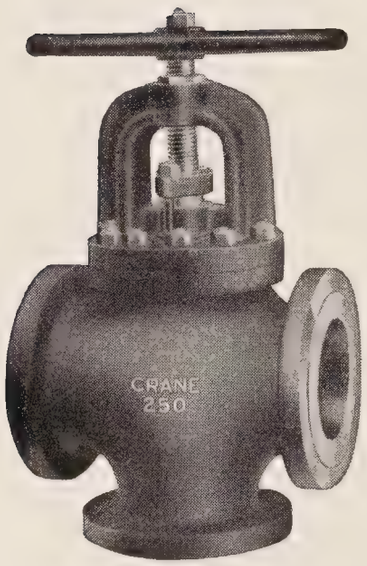
CROSS VALVES

FERROSTEEL **WITH YOKE** **HARD METAL SEATS**

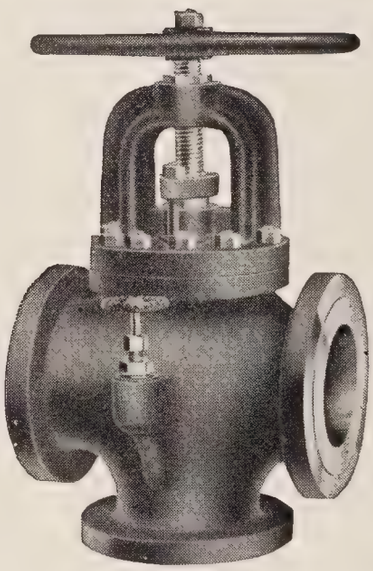
FOR SATURATED STEAM WORKING PRESSURES UP TO 250 POUNDS

FOR SUPERHEATED STEAM WORKING PRESSURES UP TO 250 POUNDS AND A TOTAL TEMPERATURE NOT TO EXCEED 500 DEGREES FAHR.

TESTED TO 800 POUNDS HYDRAULIC PRESSURE PER SQUARE INCH



No. 25 E, CROSS
CODE: CHASMATIAS



No. 31 E, CROSS WITH BY-PASS
CODE: CHIMETHLON

Size.....Inches	2	2½	3	3½	4	4½	5
Size.....Millimeters	50	64	76	90	100	113	125
No. 24 E, Screwed.....Each	33.00	40.00	45.00	50.00	55.00	70.00	75.00
No. 25 E, Flanged.....Each	35.00	43.00	50.00	55.00	60.00	75.00	80.00

Size.....Inches	6	7	8	10
Size.....Millimeters	150	175	200	250
No. 24 E, Screwed.....Each	95.00			
No. 25 E, Flanged.....Each	100.00	125.00	150.00	250.00
No. 31 E, Flanged, with By-Pass.....Each	130.00	155.00	180.00	300.00

On installations larger than 6 inches we recommend that Flanged Valves be used. It is desirable that all valves, 6 inches and larger, have a By-Pass.

In ordering, always specify the style number of valve wanted.

For general dimensions, see page 607.

Templates for drilling, page 598. Price List for drilling, page 484.

EXTRA HEAVY

SWING CHECK VALVES

FERROSTEEL
HARD METAL (BRONZE) SEATS

FOR SATURATED STEAM WORKING PRESSURES UP TO 250 POUNDS

FOR SUPERHEATED STEAM WORKING PRESSURES UP TO 250 POUNDS AND A TOTAL TEMPERATURE NOT TO EXCEED 500 DEGREES FAHR.

TESTED TO 800 POUNDS HYDRAULIC PRESSURE PER SQUARE INCH

FOR WATER WORKING PRESSURES, SEE PAGE 1

No. 39E

CODE: CHINNEROTH

MAY BE USED IN HORIZONTAL POSITION OR FOR UPWARD FLOW

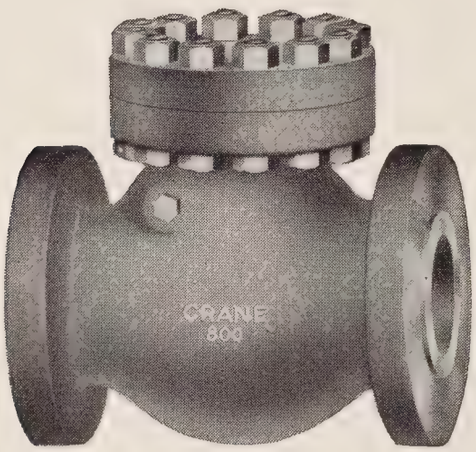
Size.....Inches	2	2½	3	3½	4	4½	5
Size.....Millimeters	50	64	76	90	100	113	125
No. 38E, Screwed.....Each	15.00	20.00	28.00	36.00	41.00	49.00	54.00
No. 39E, Flanged.....Each	17.00	22.00	30.00	38.00	44.00	52.00	57.00
End to End, Screwed..Inches	9½	10¾	11¾	12¼	13	14	15
Face to Face, Flanged..Inches	10½	11½	12½	13¼	14	15	15¾
Diameter of Flanges...Inches	6½	7½	8¼	9	10	10½	11
Size.....Inches	6	7	8	10	12	14	15
Size.....Millimeters	150	175	200	250	300	350	375
No. 38E, Screwed.....Each	66.00						
No. 39E, Flanged.....Each	70.00	88.00	105.00	175.00	250.00	350.00	350.00
End to End, Screwed..Inches	16½						
Face to Face, Flanged..Inches	17½	19¼	21	24½	28	33	33
Diameter of Flanges...Inches	12½	14	15	17½	20½	23	24½

On installations larger than 6 inches we recommend that flanged valves be used. Templates for drilling, page 598. Price List for drilling, page 484.

800 POUND
AMERICAN HYDRAULIC STANDARD
FERROSTEEL SWING CHECK VALVES
HARD METAL SEATS

TESTED TO HYDROSTATIC PRESSURES AS FOLLOWS:

2000 POUNDS WHEN OPEN
800 POUNDS WHEN CLOSED AGAINST DISC



No. 821-H
CODE: CHOFRADURA

Size.....Inches	1½	2	2½	3	3½	4	4½
Size.....Millimeters	38	50	64	76	90	100	113
No. 820 H, Screwed.....Each	30.00	37.50	45.00	60.00	75.00	83.00	100.00
No. 821 H, Flanged.....Each	30.00	37.50	45.00	60.00	75.00	83.00	100.00

Size.....Inches	5	6	7	8	10	12	
Size.....Millimeters	125	150	175	200	250	300	
No. 820 H, Screwed.....Each	113.00	165.00					
No. 821 H, Flanged.....Each	113.00	165.00	225.00	285.00	360.00	525.00	

On installations larger than 6 inch we recommend the use of Flanged Valves. Unless otherwise specified, Flanged Valves are regularly furnished with Male Face flanges.

WORKING PRESSURES

These Valves are suitable for 800 pounds pressure when used in hydraulic installations in which shock is absent or so slight as to be negligible. WHEN SUBJECT TO SHOCK they are NOT recommended for these pressures. See explanatory notes on page 175.

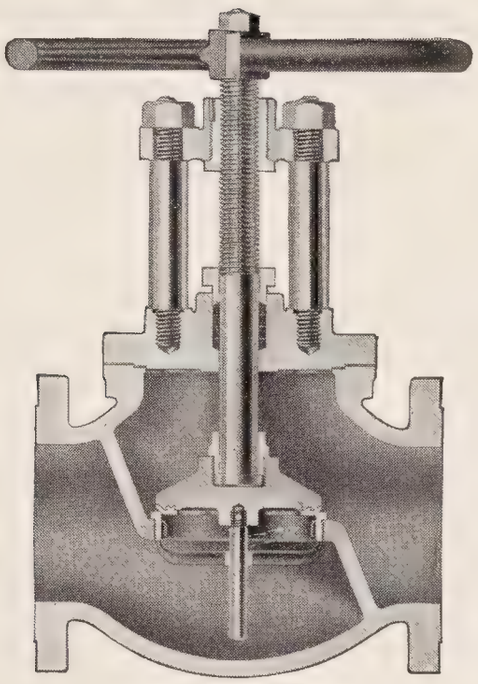
AIR OR GAS

Valves for Air or Gas are SPECIAL. See explanatory notes on page 175.

For general description see page 175.
For general dimensions see page 613.
For drilling templates see page 599.
For price list of drilling see page 486.

EXTRA HEAVY—CAST STEEL

GLOBE AND ANGLE VALVES



GENERAL SPECIFICATIONS

CLASS AA

350 LBS. STEAM WORKING PRESSURE—800° F. TOTAL TEMPERATURE.
Cast Steel Body, Bonnet, Yoke and Disc. Sizes 2½ inch and larger, discs are faced with Monel Metal; 2 inch and smaller, solid Monel Metal Discs.
Monel Metal Seats. Monel Metal Stem.

STEEL BOLTS OF HIGH TENSILE STRENGTH OR COMMERCIAL BOLTS LARGER IN DIAMETER must be used on the end flanges when valves are subjected to steam working pressures in excess of 300 lbs.

A. S. M. E. EXTRA HEAVY BOLTING using commercial bolts is not strong enough for steam working pressures in excess of 300 lbs.

CLASS A

300 LBS. STEAM WORKING PRESSURE—800° F. TOTAL TEMPERATURE.
Cast Steel Body, Bonnet, Yoke and Disc. Sizes 2½ inch and larger, discs are faced with Monel Metal; 2 inch and smaller, solid Monel Metal Discs.
Monel Metal Seats. Monel Metal Stem.

CLASS B

300 LBS. STEAM WORKING PRESSURE—800° F. TOTAL TEMPERATURE.
Cast Steel Body, Bonnet, Yoke and Disc. Sizes 2½ inch and larger, discs are faced with Monel Metal; 2 inch and smaller, solid Monel Metal Discs.
Monel Metal Seats. Rolled Steel Stem.

CLASS H

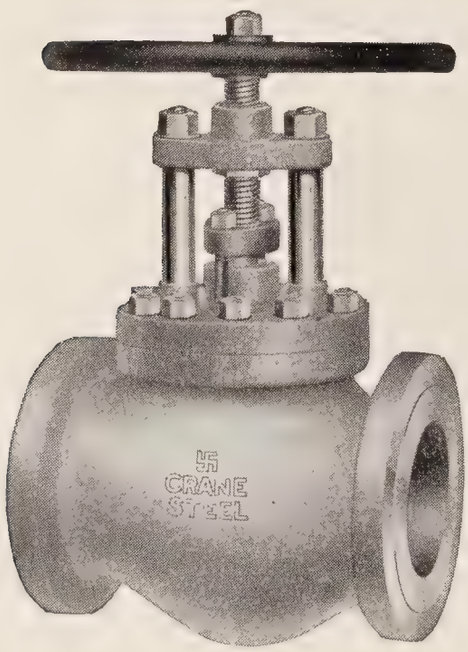
500 LBS. COLD WATER WORKING PRESSURE AND 400 LBS. BOILER FEED LINES.
Cast Steel Body, Bonnet, Yoke and Disc. Sizes 2½ inch and larger, discs are faced with Hard Metal; 2 inch and smaller, solid Hard Metal Discs.
Hard Metal Seats. Rolled Brass Stem.

EXTRA HEAVY—CAST STEEL

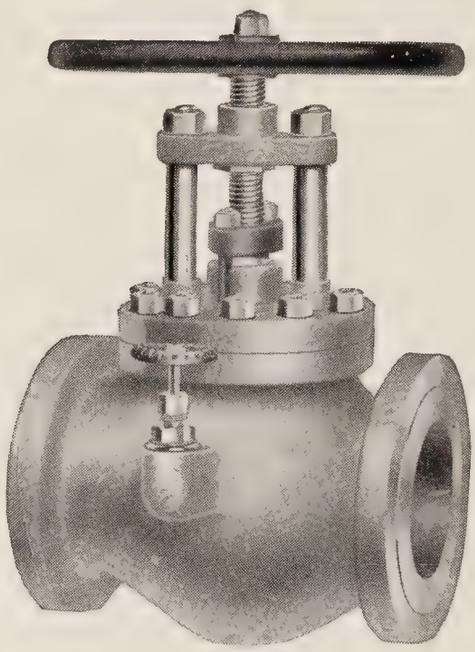
GLOBE VALVES

FLANGED **WITH CROSS HEAD YOKE**

FOR WORKING PRESSURES AND GENERAL SPECIFICATIONS SEE PAGE 137



No. 21. STEEL
CODE: CHORTINAM



No. 27. STEEL
CODE: CHUCALLO

Size.....Inches	2	2½	3	3½	4	4½
Size.....Millimeters	50	64	76	90	100	113
No. 21 A, Flanged.....Each	57.50	70.00	85.00	100.00	115.00	130.00
No. 21 B, Flanged.....Each	52.50	62.50	75.00	90.00	100.00	115.00
No. 21 H, Flanged.....Each	52.50	62.50	75.00	90.00	100.00	115.00
Size.....Inches	5	6	7	8	10	
Size.....Millimeters	125	150	175	200	250	
No. 21 A, Flanged.....Each	145.00	170.00	210.00	245.00	375.00	
No. 21 B, Flanged.....Each	125.00	145.00	180.00	210.00	325.00	
No. 21 H, Flanged.....Each	125.00	145.00	180.00	210.00	325.00	
No. 27 A, Flanged, with By-Pass.Each		215.00	255.00	290.00	425.00	
No. 27 B, Flanged, with By-Pass.Each		190.00	225.00	255.00	375.00	

All Valves 6 inches and larger should have a By-Pass.

For general dimensions, see page 609.

For drilling templates, see page 598. Price List for drilling, page 485.

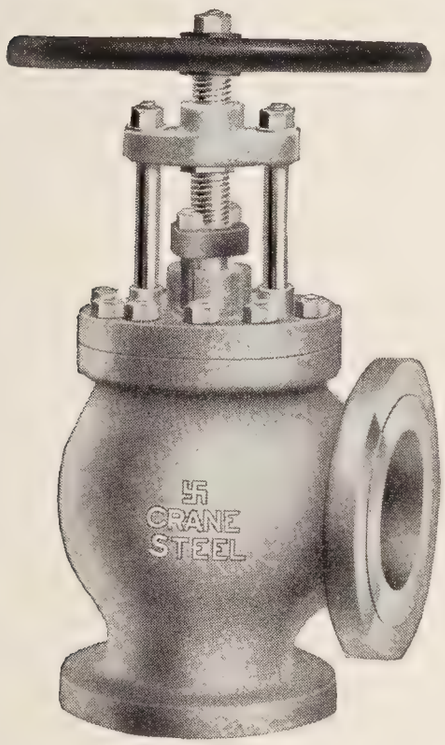
Valves are regularly furnished with a raised face $\frac{1}{16}$ inch high. For diameters see page 665.

EXTRA HEAVY—CAST STEEL

ANGLE VALVES

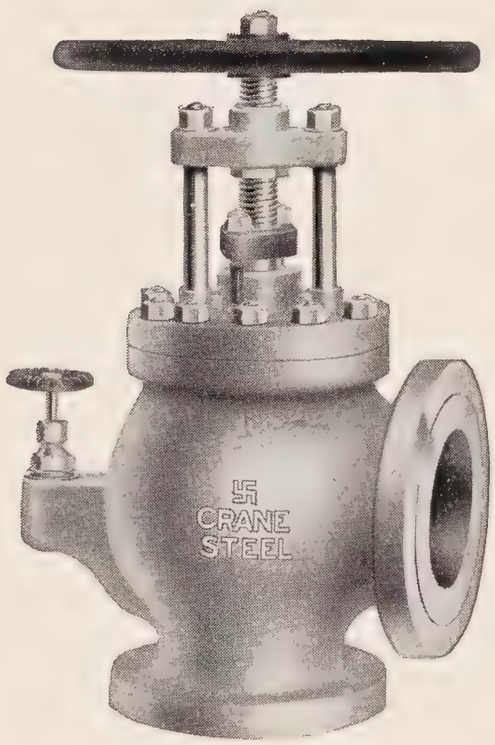
FLANGED **WITH CROSS HEAD YOKE**

FOR WORKING PRESSURES AND GENERAL SPECIFICATIONS SEE PAGE 137



No. 23. STEEL

CODE: CLATHRABAM



No. 29. STEEL

CODE: CLORADILLA

Size.....Inches	2	2½	3	3½	4	4½
Size.....Millimeters	50	64	76	90	100	113
No. 23 A, Flanged.....Each	57.50	70.00	85.00	100.00	115.00	130.00
No. 23 B, Flanged.....Each	52.50	62.50	75.00	90.00	100.00	115.00
No. 23 H, Flanged.....Each	52.50	62.50	75.00	90.00	100.00	115.00

Size.....Inches	5	6	7	8	10	
Size.....Millimeters	125	150	175	200	250	
No. 23 A, Flanged.....Each	145.00	170.00	210.00	245.00	375.00	
No. 23 B, Flanged.....Each	125.00	145.00	180.00	210.00	325.00	
No. 23 H, Flanged.....Each	125.00	145.00	180.00	210.00	325.00	
No. 29 A, Flanged, with By-Pass.Each		215.00	255.00	290.00	425.00	
No. 29 B, Flanged, with By-Pass.Each		190.00	225.00	255.00	375.00	

All Valves 6 inches and larger should have a by-pass.

For general dimensions, see page 609.

For drilling templates, see page 598. Price List for drilling, page 485.

Valves are regularly furnished with a raised face 1/16 inch in height. For diameters see page 665.

EXTRA HEAVY

CAST STEEL SWING CHECK VALVES

CAST STEEL BODY — HARD METAL (BRONZE) SEATS

FOR 500 POUNDS COLD WATER WORKING PRESSURE

FOR BOILER FEED LINES UP TO 400 POUNDS WORKING PRESSURE

No. 39 H. STEEL

CODE: CLUDIFORM

MAY BE USED IN A HORIZONTAL LINE OR FOR UPWARD FLOW

Size	Inches	2	2½	3	3½	4	4½
Size	Millimeters	50	64	76	90	100	113
No. 39 H, Flanged	Each	45.00	55.00	62.50	72.50	85.00	95 00
Face to Face	Inches	10½	11½	12½	13¼	14	15
Diameter of Flanges	Inches	6½	7½	8¼	9	10	10½
Size	Inches	5	6	7	8	10	12
Size	Millimeters	125	150	175	200	250	300
No. 39 H, Flanged	Each	100.00	120.00	145.00	160.00	275.00	325.00
Face to Face	Inches	15¾	17½	19¼	21	24½	28
Diameter of Flanges	Inches	11	12½	14	15	17½	20½

Note.—"Y" Pattern Stop Check Valves are meeting with considerable favor among many engineers for a hand-closed check valve in boiler feed lines and may be substituted for No. 39 H. This Valve has the important advantage of being easily reground.

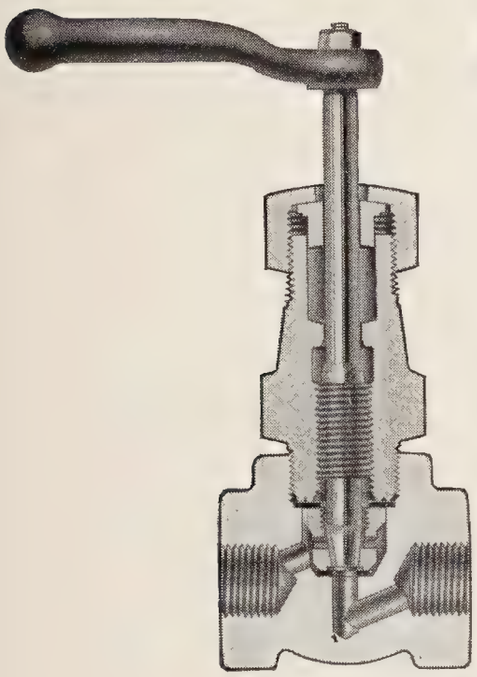
For drilling templates, see page 598. Price List for drilling, page 485.

Flanges are furnished with a raised face 1/16 inch high. For diameters of raised faces see page 665.

6000 POUND
FORGED STEEL HYDRAULIC

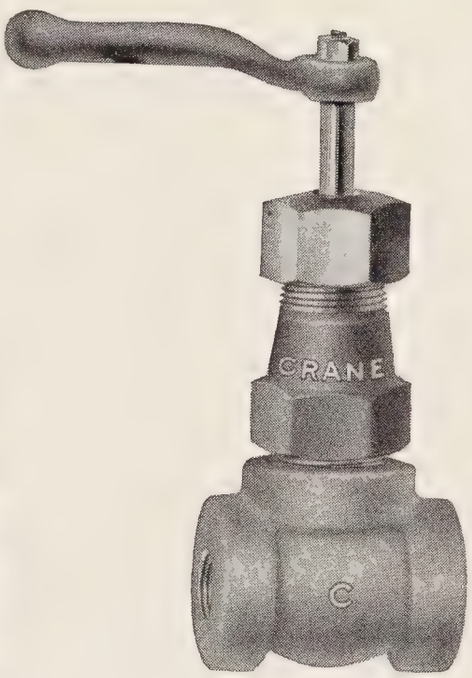
GLOBE, ANGLE AND HORIZONTAL CHECK VALVES

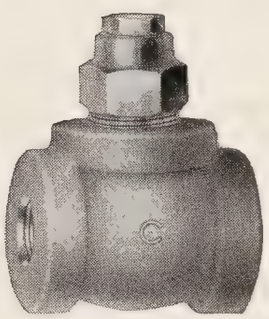
FOR COLD WATER OR OIL WORKING PRESSURES UP TO 6000 POUNDS



No. 225 H. GLOBE

CODE: COARABAMUS





No. 227 H.
HORIZONTAL CHECK
CODE: COATTIVO

Size.....Inches	¼	⅜	½	¾	1	1¼	1½	2
Size.....Millimeters	6	9	13	19	25	32	38	50
No. 225 H, Globe.....Each	21.00	21.00	23.00	27.00	33.00	45.00	130.00	175.00
No. 226 H, Angle.....Each	21.00	21.00	23.00	27.00	33.00	45.00	130.00	175.00
No. 227 H Horizontal Check.. Each		21.00	23.00	27.00	33.00	45.00		

WORKING PRESSURES

These Valves are suitable for the working pressure specified above when used in hydraulic installations in which shock is absent or so slight as to be negligible. WHEN SUBJECT TO SHOCK they are NOT recommended for these pressures. See explanatory notes on page 175.

AIR OR GAS

Valves for Air or Gas are SPECIAL. See explanatory notes on page 175.

The inside diameter of these Valves is slightly smaller than that of Double Extra Strong Pipe.

These Valves have been designed to meet the demand for a thoroughly reliable Valve for use with hydraulic presses and extreme high pressure air, gas or oil installations.

The body is machined from a solid steel forging.

Sizes ⅜ to 1 inch, inclusive, are made with screwed bonnet; 1¼ inch and larger sizes are made with a bolted bonnet.

The seat and disc are easily renewable.

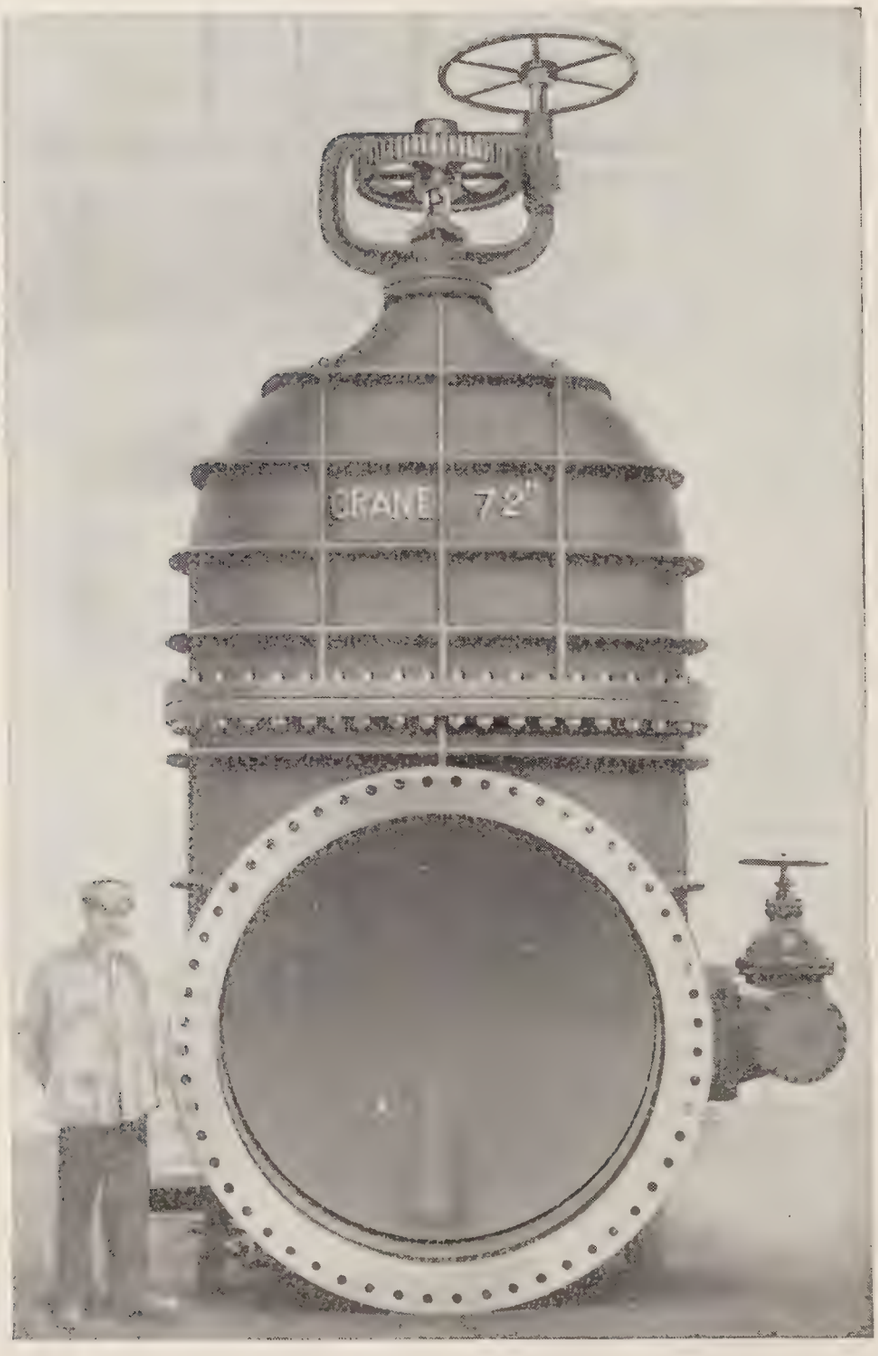
Valves for higher pressures made to order. Prices on application.

ILLUSTRATION OF

72 INCH LOW PRESSURE

GATE VALVE

OPERATED WITH SPUR GEARS



This Valve was installed in the City Water Works System of Tacoma, Wash.

Weight, 32,240 pounds.

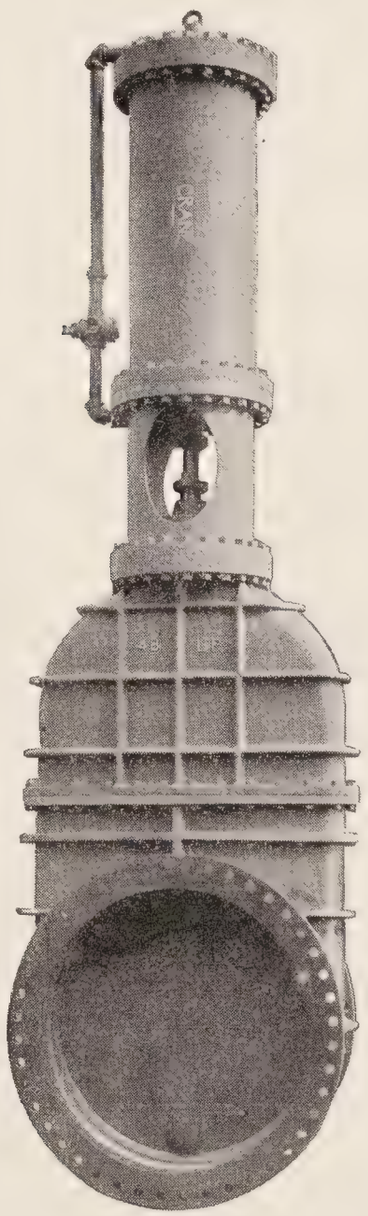
Height, over all, 17 feet 8 inches.

GATE VALVES

WITH HYDRAULIC LIFT CYLINDERS

FOR ALL PRESSURES AND PURPOSES

As the name indicates, these Valves are actuated by water pressure, either from the city water supply, or from boiler feed or service pumps, by simply opening the four-way cock, which may be located in any convenient place within reasonable distance from the Valve.



Unless otherwise specified, these Valves will be furnished with the piston rod extending through the top cylinder head, for the purpose of indicating whether the Valve is open, partly open or closed.

We make these Valves to order, either screwed, flanged or hub ends.

By-Pass Valves are also furnished, when so specified.

Orders or inquiries for these Valves should give the following information:

1. Specify whether Screwed or Flanged or Hub Valve is wanted.
2. State whether by-pass is required.
3. Specify whether the Valve will be installed with Stem Horizontal or Vertical.
4. Designate fluid used to operate Valve, whether Steam, Hot or Cold Water, etc.
5. State maximum and minimum working pressure on Valve.
6. State the Pressure Available for Operating the Piston in the Cylinder.

We recommend that the water pressure for actuating the cylinder be as high as available, thus allowing the use of as small diameter cylinder as possible, on large size Valves.

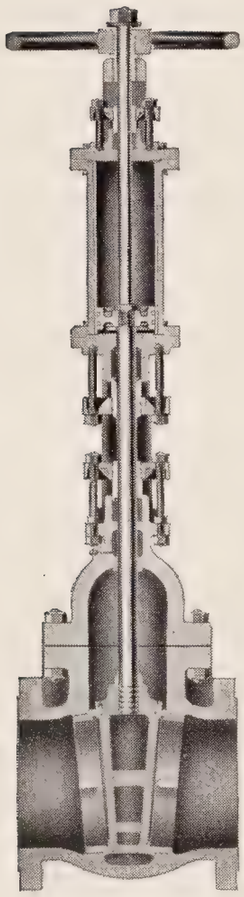
For Hydraulic Lift Gate Valves with special Hand Releasing Device, see page 144.

GATE VALVES

WITH HYDRAULIC LIFT AND SPECIAL HAND RELEASING DEVICE

FERROSTEEL — BRASS LINED CYLINDER

HARD METAL SEATS — WEDGE GATE



FOR SATURATED STEAM WORKING PRESSURES UP TO 250 POUNDS

FOR SUPERHEATED STEAM WORKING PRESSURES UP TO 250 POUNDS AND A TOTAL TEMPERATURE NOT TO EXCEED 500 DEGREES FAHR.

WHEN HYDRAULIC LIFT GATE VALVES ARE WANTED WITH SPECIAL HAND RELEASING DEVICE, ORDER SHOULD READ ACCORDINGLY. VALVES WITHOUT HAND RELEASING DEVICE, AS SHOWN ON PAGE 143, WILL ALWAYS BE FURNISHED UNLESS OTHERWISE SPECIFIED.

As the name indicates, these Valves are actuated by water pressure, either from suitably high pressure city water supply or from boiler feed or service pumps, by simply opening the four-way cock, which may be located in any convenient place within reasonable distance of the Valve.

The Valve Stem extending above the hand wheel indicates whether the Valve is open, partly open or closed.

The hand wheel at top of Valve has a very short travel and is used only for the purpose of releasing the wedge from its seats, after it has been closed tightly by the piston. This wheel is not suitable for fully closing or opening the Valve.

We make these Valves to order, either screwed or flanged ends.

By-Pass Valves also furnished, when so specified.

These valves can be made from any of our various regular lines of gate valves with corresponding pressure and temperature ratings.

Orders or inquiries for these Valves should give the following information:

1. Specify whether screwed, flanged or hub end valve is wanted.
2. State whether by-pass is required.
3. Specify whether the valve will be installed with stem horizontal or vertical.
4. Designate fluid used to operate valve, whether steam, hot or cold water, etc.
5. State maximum and minimum working pressure on valve.
6. State the pressure available for operating the piston in the cylinder.

We recommend that the water pressure for actuating the cylinder be as high as available, thus allowing the use of as small diameter cylinder as possible, on large size Valves.

LOW PRESSURE

WEDGE GATE VALVES

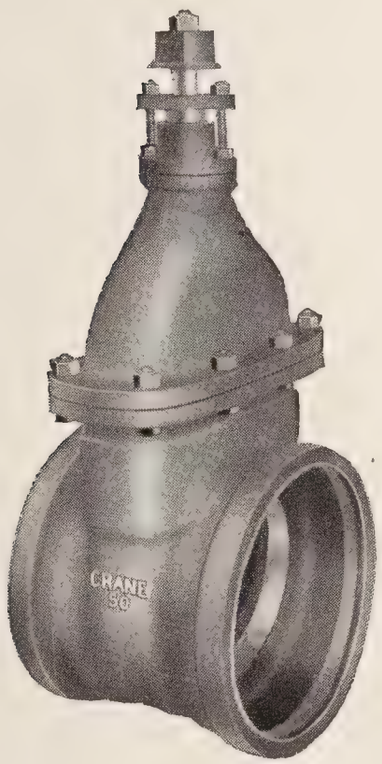
NON-RISING STEM

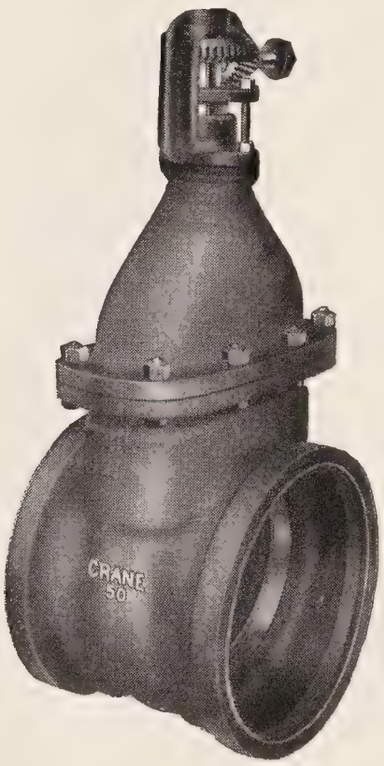
IRON BODY BRASS TRIMMINGS

HUB ENDS FOR WOOD PIPE

FOR WATER WORKING PRESSURES UP TO 50 POUNDS

TESTED TO 50 POUNDS HYDRAULIC PRESSURE





No. 498. HUB

CODE: CODALINA

Size.....Inches	4	6	8	10	12	14	16
Size.....Millimeters	100	150	200	250	300	350	400
Price.....Each	18.50	30.50	50.00	82.00	120.00	165.00	215.00
Size.....Inches	18	20	24	30	36	*42	*48
Size.....Millimeters	450	500	600	750	900	1050	1200
Price.....Each	300.00	345.00	540.00	1025.00	1450.00		
Price, with Gear, without By-Pass .....Each			665.00	1250.00	1750.00	2250.00	3200.00

*These sizes are always furnished geared unless otherwise ordered.

The Hub Ends of these Valves have the same construction and inside diameter of hub as our No. 462 Standard Water Gates, and may be used with either Cast Iron or Wood Pipe—however, where diameters of hubs given in table, page 615, are not suitable, the required diameters will be furnished on Valves at a special price.

Hubs are usually furnished rough—if bored hubs are required, orders should so specify. Prices on application.

LARGER SIZES, PRICES ON APPLICATION

For general dimensions, see page 615.

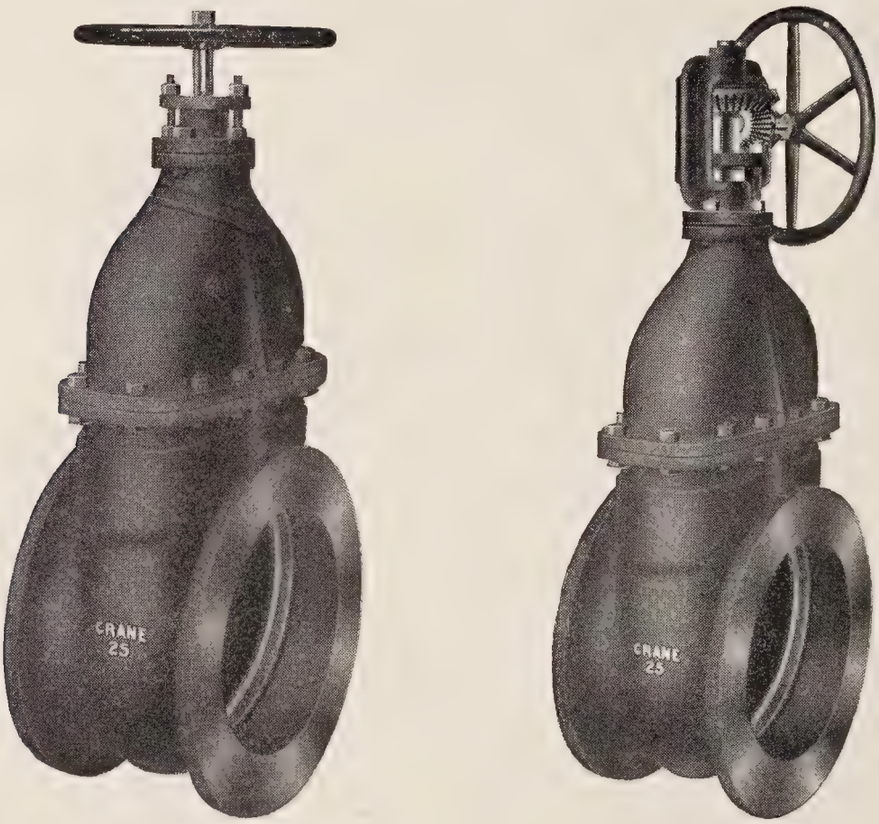
LOW PRESSURE

WEDGE GATE VALVES

NON-RISING STEM

IRON BODY — BRASS TRIMMINGS

FOR STEAM WORKING PRESSURES UP TO 25 POUNDS
FOR WATER WORKING PRESSURES UP TO 50 POUNDS
TESTED TO 50 POUNDS HYDRAULIC PRESSURE



No. 491

CODE: CODILLERA

Size....Inches	12	14	16	18
Size....Millimeters	300	350	400	450
Price....Each	120.00	165.00	215.00	300.00
Price, with Gear....Each				
Size....Inches	20	22	24	26
Size....Millimeters	500	550	600	650
Price....Each	345.00	475.00	540.00	740.00
Price, with Gear....Each			665.00	900.00
Size....Inches	28	30	32	34
Size....Millimeters	700	750	800	850
Price....Each	875.00	1025.00	1125.00	1200.00
Price, with Gear....Each	1075.00	1250.00	1375.00	1475.00
Size....Inches	36	42	48	
Size....Millimeters	900	1050	1200	
Price....Each	1450.00			
Price, with Gear....Each	1750.00	2250.00	3200.00	

The Stem in these Valves is made of Brass. (Crane Stem Metal.)

These Valves are suitable for Low Pressure and Exhaust Steam, Vacuum Lines, etc.

When wanted for gas, we can furnish **ALL IRON VALVES** at a special price.

LARGER SIZES, PRICES ON APPLICATION

For general dimensions, see page 615.
Templates for drilling, page 596 and 597. Price List for drilling, page 483.

LOW PRESSURE

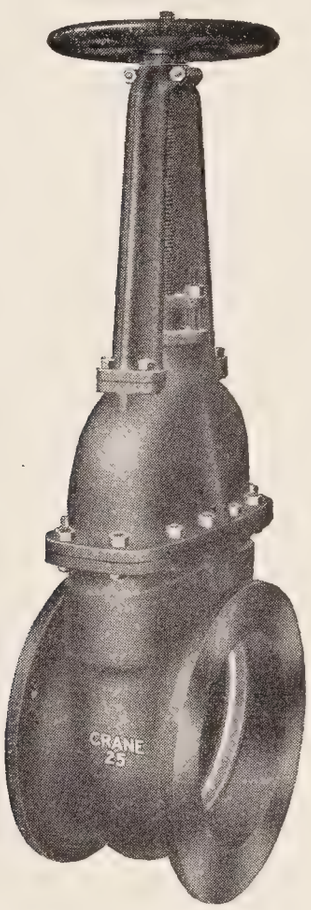
WEDGE GATE VALVES

IRON BODY — RISING STEM — BRASS TRIMMINGS

OUTSIDE SCREW AND YOKE

FOR STEAM WORKING PRESSURES UP TO 25 POUNDS
FOR WATER WORKING PRESSURES UP TO 50 POUNDS

TESTED TO 50 POUNDS HYDRAULIC PRESSURE



No. 493. FLANGED

CODE: COGNOSCUDO

Size.....Inches	12	14	16	18	20	22	24
Size.....Millimeters	300	350	400	450	500	550	600
Price.....Each	150.00	200.00	255.00	340.00	395.00	535.00	610.00
Size.....Inches	26	28	30	32	34	36	
Size.....Millimeters	650	700	750	800	850	900	
Price.....Each	820.00	965.00	1125.00	1250.00	1350.00	1650.00	

The Stems in these Valves are made of Steel and Plated. Brass Stems, when so ordered, will be furnished at an extra price.

These Valves are suitable for Low Pressure and Exhaust Steam, Vacuum Lines, etc.

These Valves have a Rising Stem, which indicates whether the Valve is open, partly open or closed.

LARGER SIZES, PRICES ON APPLICATION

For general dimensions, see page 615.

Templates for drilling, page 596. Price List for drilling, page 483.

STANDARD

WEDGE GATE VALVES

IRON BODY **BRASS TRIMMINGS**

FOR STEAM WORKING PRESSURES

SIZES 16 INCH AND SMALLER, UP TO 125 POUNDS
SIZES 18 INCH AND LARGER, UP TO 100 POUNDS

FOR WATER WORKING PRESSURES

SIZES 12 INCH AND SMALLER, UP TO 175 POUNDS
SIZES 14 AND 16 INCH, UP TO 150 POUNDS
SIZES 18 INCH AND LARGER, UP TO 120 POUNDS

These Valves are tested to 150 pounds hydraulic pressure with the Valve closed, and we have at various times subjected them to a hydraulic pressure, without leaking, as follows:

Size	2 to 16 inch.	18 to 24 inch.	30 inch.
Tight at	500 pounds.	300 pounds.	250 pounds.

BREAKING STRENGTH

We have at various times broken an assortment of sizes under hydraulic pressure and found the following result:

Size	4 to 8 inch.	10 to 16 inch.
Burst at	1000 to 1500 pounds.	900 pounds.

SIZES 18 TO 30 INCHES

The larger sizes, 18 to 30 inch, we have not bursted, but have subjected the 18 inch to 450 pounds pressure, and the 20 to 30 inch to 300 pounds pressure without bursting the casting.

It will seem that the factor of safety is very high, but they not only have to stand the strain due to the working pressure, but are also liable to unusual strains such as expansion and contraction, water hammer, weight of piping, settling, etc., and for this reason, we keep the limit of the working pressure for which we recommend them, down to a perfectly safe point.

It is, however, possible that these Standard Valves might be reasonably satisfactory for a much higher working pressure, provided the expansion, contraction, weight of piping and settling were all taken care of.

Still, the cutting effect of the steam on the disc and seats would render these Valves less durable than the Valves which we recommend for a higher pressure of steam.

The guides on the disc and ribs in the body are so finished and fitted as to insure true and easy movement of disc and to prevent wear of the faces; and also prevent the disc from touching the seats of the Valves, except at point of closing.

The seats in the body of these Valves and the faces of discs are made of brass.

The Stems in the Valves with inside screw are made of Brass (Crane Stem Metal) and in the Valves with outside screw and yoke, are made of Steel and plated. Brass Stems for the latter Valves will be furnished at an extra price.

The stuffing box flange on all Hub End Valves is made of Malleable Iron with a brass Gland screwed in giving additional strength and durability at this point, a particularly desirable feature on Water Service Valves.

These Valves are so constructed that when wide open they may be repacked while under pressure.

See explanatory cuts on opposite page.

VALVES FOR AIR OR GAS SERVICE WILL BE GIVEN A SPECIAL AIR TEST. PRICES ON APPLICATION

STANDARD HUB END GATE VALVES ARE GIVEN A SPECIAL TEST OF 300 POUNDS HYDRAULIC PRESSURE PER SQUARE INCH

STANDARD

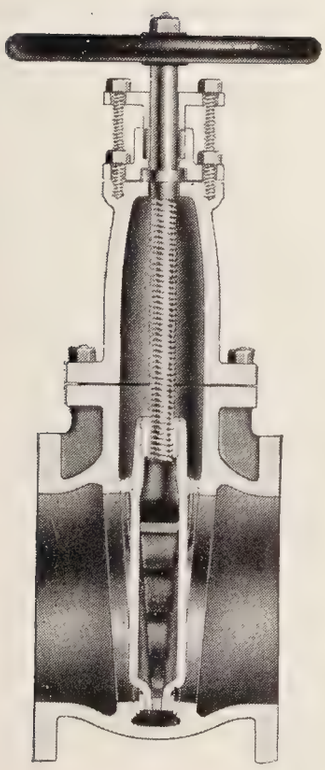
WEDGE GATE VALVES

IRON BODY **BRASS TRIMMINGS**

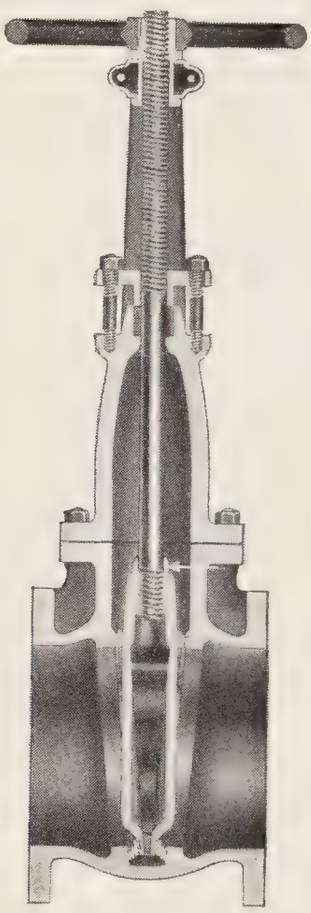
FOR STEAM WORKING PRESSURES:

SIZES 16 INCH AND SMALLER, UP TO 125 POUNDS
SIZES 18 INCH AND LARGER, UP TO 100 POUNDS

FOR WATER PRESSURES, SEE PAGE 148



No. 461
NON-RISING STEM



No. 465
OUTSIDE SCREW AND YOKE

THESE VALVES MAY BE PACKED WHILE UNDER PRESSURE AS FOLLOWS:

NON-RISING STEM VALVES. Open the Valve full to jam disc against top of the bonnet, thus drawing the collar on the stem tightly against a machined surface on the bonnet forming a tight joint.

OUTSIDE SCREW AND YOKE VALVES. Open the Valve full so the tapered collar on the stem (indicated by arrow) is seated into a machined surface on the under side of the top of the bonnet, forming a tight joint.

Standard Flanged Valves will always be furnished plain faced, and not drilled, unless otherwise ordered.

The dimensions of Flanges of our Standard and Low Pressure Valves and Flanged Fittings are the American Standard for 125-pound working pressure.

STANDARD

WEDGE GATE VALVES

NON-RISING STEM

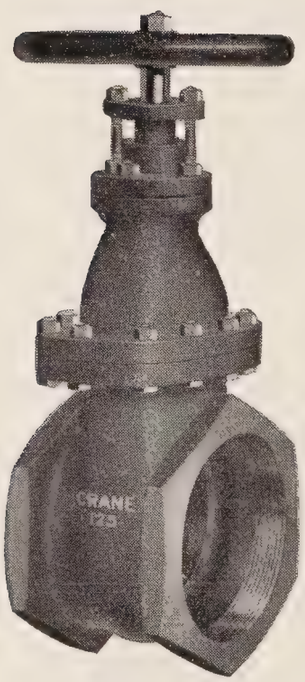
IRON BODY **BRASS TRIMMINGS**

FOR STEAM WORKING PRESSURES

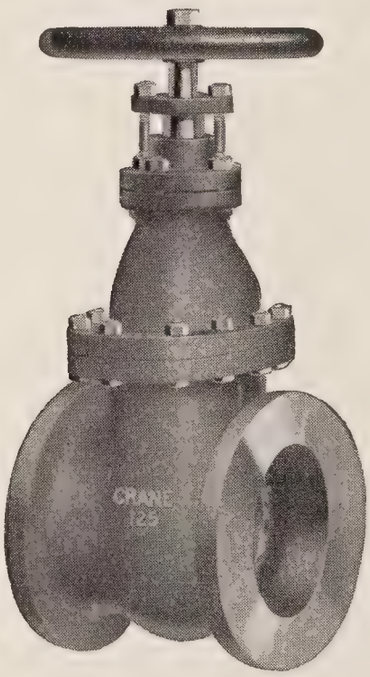
SIZES 16-INCH AND SMALLER, UP TO 125 POUNDS

SIZES 18-INCH AND LARGER, UP TO 100 POUNDS

FOR WATER WORKING PRESSURES, SEE PAGE 148



No. 460
SCREWED
CODE: COHOBADAS



No. 461
FLANGED
CODE: COLHESSEM

Size.....Inches	2	2½	3	3½	4	4½	5
Size.....Millimeters	50	64	76	90	100	113	125
No. 460, Screwed.....Each	10.00	11.50	14.00	17.00	19.00	24.00	27.50
No. 461, Flanged.....Each	12.00	13.50	16.50	19.50	23.00	28.00	31.50
Size.....Inches	6	7	8	9	10	12	14	15
Size.....Millimeters	150	175	200	225	250	300	350	375
No. 460, Screwed.Each	32.50	45.00	54.00	76.00	90.00	125.00		
No. 461, Flanged.Each	36.50	49.00	58.00	81.00	95.00	133.00	181.00	220.00
Size.....Inches	16	18	20	22	24	26	28	30
Size.....Millimeters	400	450	500	550	600	650	700	750
No. 461, Flanged.Each	260.00	350.00	425.00	530.00	600.00	800.00	950.00	1100.00

For general dimensions, see page 617.

Templates for drilling, page 596. Price List for drilling, page 483.

STANDARD

WEDGE GATE VALVES

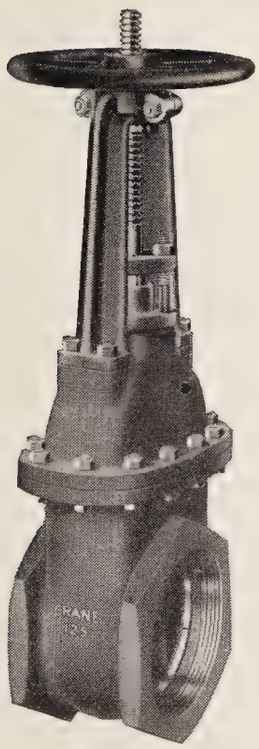
IRON BODY

WITH OUTSIDE SCREW AND YOKE
FOR STEAM WORKING PRESSURES

BRASS TRIMMINGS

SIZES 16 INCH AND SMALLER, UP TO 125 POUNDS
SIZES 18 INCH AND LARGER, UP TO 100 POUNDS

FOR WATER WORKING PRESSURES, SEE PAGE 148



SCREWED

For general dimensions, see page 617.

Templates for drilling, page 596.

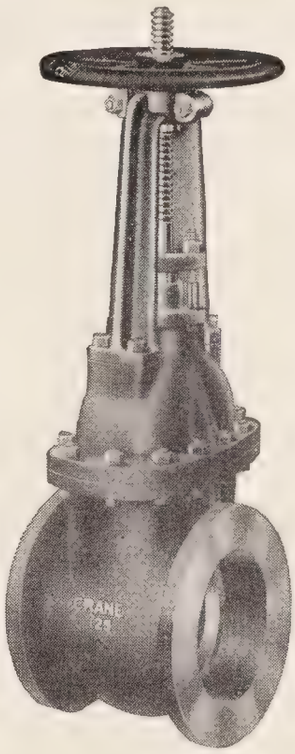
Price List for drilling, page 483.

No. 464
CODE: COLLEMBOLA

No. 464½
CODE: COLONISETH

No. 465
CODE: COLMATAGE

No. 465½
CODE: COLORAMINI



FLANGED

Size.....Inches	2	2½	3	3½	4	4½
Size.....Millimeters	50	64	76	90	100	113
No. 464, with Steel Stem, Screwed . . .Each	17.50	19.00	22.00	25.00	30.00	37.00
No. 465, with Steel Stem, Flanged. . . .Each	19.50	21.00	24.50	27.50	34.00	41.00
No. 464½, with Brass Stem, Screwed. . Fach	19.00	20.50	23.50	27.00	32.50	40.00
No. 465½, with Brass Stem, Flanged. . Each	21.00	22.50	26.00	29.50	36.50	44.00
Size.....Inches	5	6	7	8	9	10
Size.....Millimeters	125	150	175	200	225	250
No. 464, with Steel Stem, Screwed . . .Each	42.00	48.00	64.00	80.00	105.00	122.00
No. 465, with Steel Stem, Flanged. . . .Each	46.00	52.00	68.00	84.00	110.00	127.00
No. 464½, with Brass Stem, Screwed. . Each	45.00	52.00	69.00	86.00	113.00	131.00
No. 465½, with Brass Stem, Flanged. . Each	49.00	56.00	73.00	90.00	118.00	136.00
Size.....Inches	12	14	15	16	18	20
Size.....Millimeters	300	350	375	400	450	500
No. 464, with Steel Stem, Screwed . . .Each	160.00					
No. 465, with Steel Stem, Flanged. . . .Each	168.00	236.00	285.00	325.00	435.00	525.00
No. 464½, with Brass Stem, Screwed. . Each	172.00					
No. 465½, with Brass Stem, Flanged. . Each	180.00	255.00	310.00	350.00	470.00	565.00
Size.....Inches	22	24	26	28	30	
Size.....Millimeters	550	600	650	700	750	
No. 465, with Steel Stem, Flanged . . .Each	650.00	725.00	950.00	1125.00	1300.00	
No. 465½, with Brass Stem, Flanged. . Each	700.00	775.00	1025.00	1210.00	1400.00	

STANDARD

GATE VALVES

WATER GATES

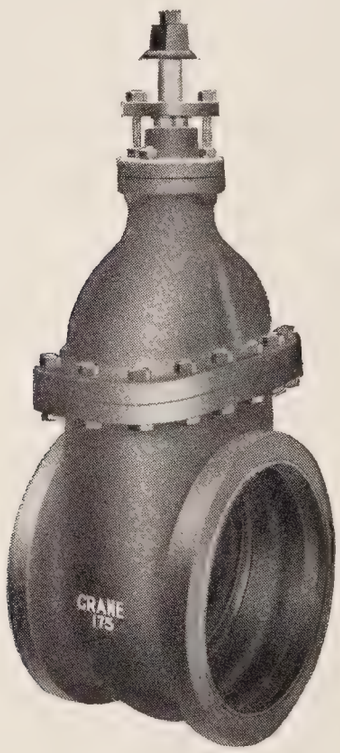
IRON BODY BRASS TRIMMINGS WEDGE GATE

OPEN TO THE LEFT NON-RISING STEM

FOR WATER WORKING PRESSURES:

SIZES 12 INCH AND SMALLER, UP TO 175 POUNDS
SIZES 14 AND 16 INCH, UP TO 150 POUNDS
SIZES 18 INCH AND LARGER, UP TO 120 POUNDS

TESTED TO 300 POUNDS HYDRAULIC PRESSURE



No. 462. HUB
CODE: COMPINCHES

Size.....Inches	2	3	4	5	6	7	8	10
Size.....Millimeters	50	76	100	125	150	175	200	250
Price.....Each	10.00	14.00	19.00	27.50	32.50	45.00	54.00	90.00
For Matheson or Converse Joint Pipe.Each		14.00	19.00		32.50		54.00	90.00
Size.....Inches	12	14	16	18	20	24	30	
Size.....Millimeters	300	350	400	450	500	600	750	
Price.....Each	125.00	173.00	250.00	340.00	415.00	590.00	1075.00	
Price,with By-Pass Ea.			315.00	415.00	500.00	690.00	1225.00	

These Valves will be furnished "Open to the Right" when so ordered, at same price.

All Valves 20 inch and smaller have 2-inch square head on stem; 24 inch and larger have 3-inch square head on stem. Stuffing boxes have bolted followers.

These Valves are suitable for use with Cast Iron or Wood Pipe—however, where diameters of hubs given in table, page 617, are not suitable, the required diameters will be furnished on valves at a special price.

Hubs are usually furnished rough—if bored hubs are required orders should so specify. Prices on application.

For general dimensions, see page 617.

STANDARD

WEDGE GATE VALVES

OPERATED WITH GEARING

IRON BODY

NON-RISING STEM

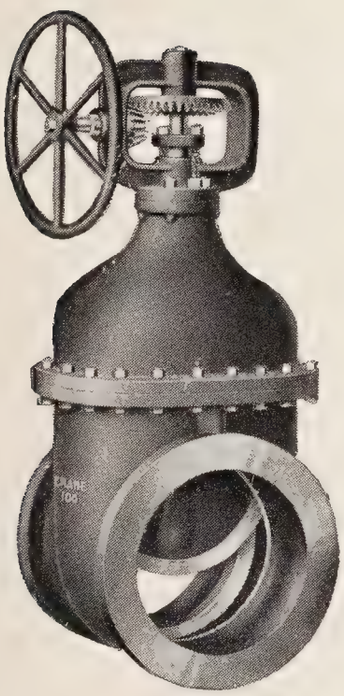
OPEN TO THE LEFT

BRASS TRIMMINGS

FOR STEAM WORKING PRESSURES

SIZES 16-INCH AND SMALLER, UP TO 125 POUNDS

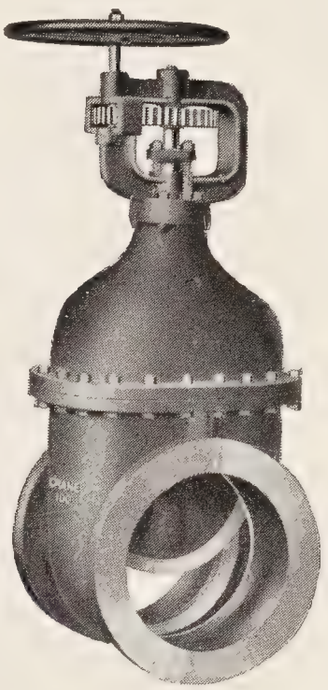
SIZES 18-INCH AND LARGER, UP TO 100 POUNDS



FLANGED
WITH SPUR GEARS
CODE: COMPUNGEVI

FOR WATER WORKING PRESSURES, SEE PAGE 148

No. 463.



FLANGED
WITH BEVEL GEARS
CODE: CONFISCABO

Size.....Inches	16	18	20	22	24	26
Size.....Millimeters	400	450	500	550	600	650
Price, Flanged.....Each	360.00	460.00	550.00	675.00	750.00	1000.00
Price, Flg., with By-Pass. Each	425.00	535.00	635.00	775.00	850.00	1125.00
Price, Hub Ends.....Each	350.00	450.00	540.00		740.00	
Price, Hub Ends, with By-Pass.	415.00	525.00	625.00		840.00	

Size.....Inches	28	30	36	42	48
Size.....Millimeters	700	750	900	1050	1200
Price, Flanged.....Each	1200.00	1400.00	2100.00	3150.00	4300.00
Price, Flanged, with By-Pass.....Each	1350.00	1550.00	2300.00	3400.00	4600.00
Price, Hub Ends.....Each		1375.00	2050.00	3100.00	4250.00
Price, Hub Ends, with By-Pass...Each		1525.00	2250.00	3350.00	4550.00

In ordering, state whether Spur or Bevel Gearing is wanted, also if Hub or Flanged Ends.

Prices for larger sizes or sizes not listed, upon application.

Hub End Valves are always furnished with square stem nut instead of hand wheel unless otherwise ordered.

For illustration of various styles of gearing, see page 312.

For general dimensions, see page 617.

Templates for drilling, page 596. Price List for drilling, page 483.

STANDARD

WEDGE GATE VALVES

QUICK OPENING — SLIDING STEM

IRON BODY — BRASS TRIMMINGS

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS

FOR WATER WORKING PRESSURES, SEE PAGE 148

No. 471
CODE CONJUGABOR

Size.....Inches	2	2½	3	3½	4	4½	5	6
Size.....Millimeters	50	64	76	90	100	113	125	150
No. 470, Screwed...Each	17.50	19.00	22.00	25.00	30.00	37.00	42.00	48.00
No. 471, Flanged...Each	19.50	21.00	24.50	27.50	34.00	41.00	46.00	52.00
Size.....Inches	7	8	9	10	12	14	15	16
Size.....Millimeters	175	200	225	250	300	350	375	400
No. 470, Screwed...Each	64.00	80.00	105.00	122.00	160.00			
No. 471, Flanged ..Each	68.00	84.00	110.00	127.00	168.00	236.00	285.00	325 00

For general dimensions, see pages 617.

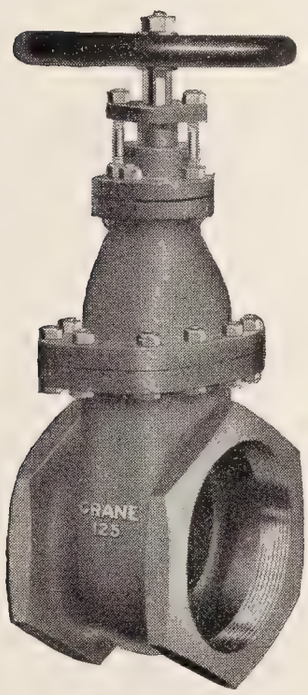
Templates for drilling, page 596. Price List for drilling, page 483.

STANDARD

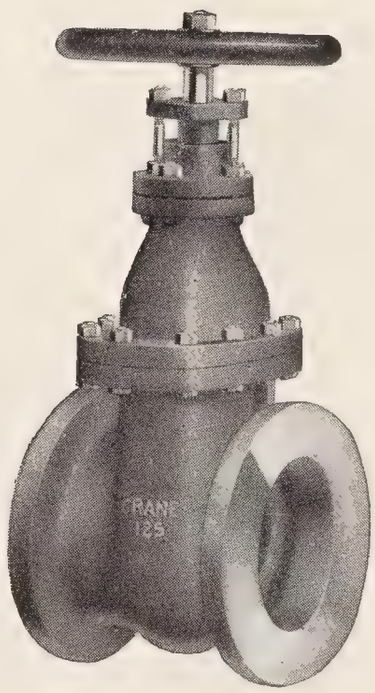
ALL-IRON
WEDGE GATE VALVES

OPEN TO THE LEFT — NON-RISING STEM

FOR 125-POUND STEAM WORKING PRESSURE.



No. 472
SCREWED
CODE: CONLOARAN



No. 473
FLANGED
CODE: CONMINANSE

Size.....Inches	2	2½	3	3½	4	4½
Size.....Millimeters	50	64	76	90	100	113
No. 472, Screwed.....Each	10.00	11.50	14.00	17.00	19.00	24.00
No. 473, Flanged.....Each	12.00	13.50	16.50	19.50	23.00	28.00
Size.....Inches	5	6	7	8	9	
Size.....Millimeters	125	150	175	200	225	
No. 472, Screwed.....Each	27.50	32.50	45.00	54.00	76.00	
No. 473, Flanged.....Each	31.50	36.50	49.00	58.00	81.00	
Size.....Inches	10	12	14	15	16	
Size.....Millimeters	250	300	350	375	400	
No. 472, Screwed.....Each	90.00	125.00				
No. 473, Flanged.....Each	95.00	133.00	181.00	220.00	260.00	

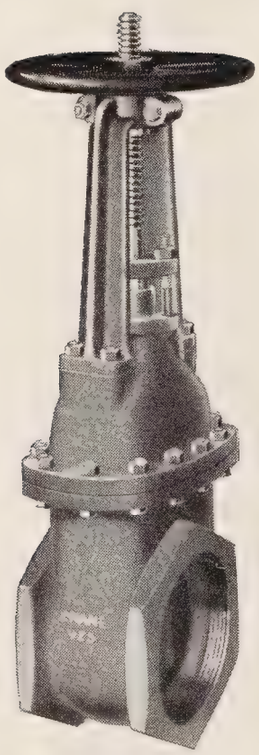
For general dimensions, see page 617.
Templates for drilling, page 596. Price List for drilling, page 483.

STANDARD

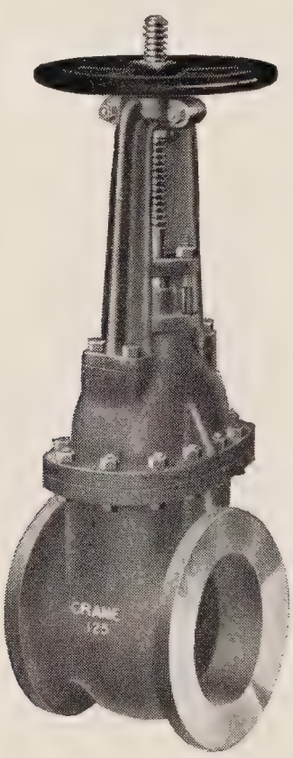
ALL-IRON
WEDGE GATE VALVES

OUTSIDE SCREW AND YOKE

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS



No. 475 SCREWED
CODE: CONNEXURUM



No. 475½ FLANGED
CODE: CONNUBATIS

Size.....Inches	2	2½	3	3½	4	4½	5
Size.....Millimeters	50	64	76	90	100	113	125
No. 475, with Steel Stem, Screwed Each	17.50	19.00	22.00	25.00	30.00	37.00	42.00
No. 475½ with Steel Stem, Flanged Each	19.50	21.00	24.50	27.50	34.00	41.00	46.00
Size.....Inches	6	7	8	9	10	12	
Size.....Millimeters	150	175	200	225	250	300	
No. 475, with Steel Stem, Screwed Each	48.00	64.00	80.00	105.00	122.00	160.00	
No. 475½ with Steel Stem, Flanged Each	52.00	68.00	84.00	110.00	127.00	168.00	

For general dimensions, see page 617.
Templates for drilling, page 596. Price List for drilling, page 483.

STANDARD

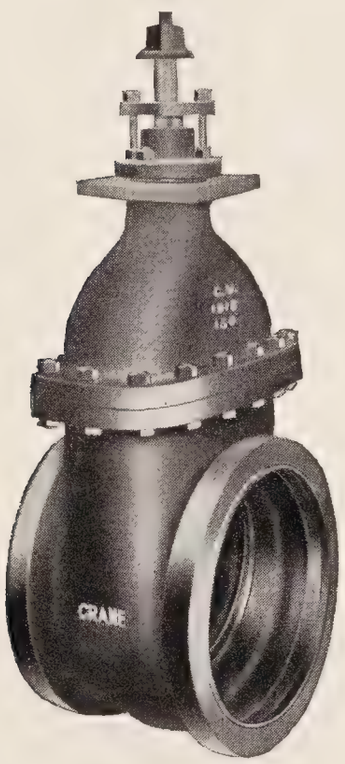
WEDGE GATE VALVES

UNDERWRITERS, PATTERN

IRON BODY | BRASS TRIMMINGS NON-RISING STEM | HUB END

FOR WATER WORKING PRESSURES UP TO 150 POUNDS

TESTED TO 300 POUNDS HYDRAULIC PRESSURE



No. 462½. HUB

CODE: CONOPIAL

Size.....Inches	4	6	8	10	12
Size.....Millimeters	100	150	200	250	300
Price.....Each	19.00	32.50	54.00	90.00	125.00

These Valves are designed in accordance with the rules and requirements of the National Fire Protection Association.

These Valves are marked "CU" to denote their use for FIRE PROTECTION SERVICE.

The Indicator Post Flange is cast on the bonnet and is not a separate piece as ordinarily used.

INDICATOR POSTS for use with the above Valves are shown on page 309.

For general dimensions, see page 617.

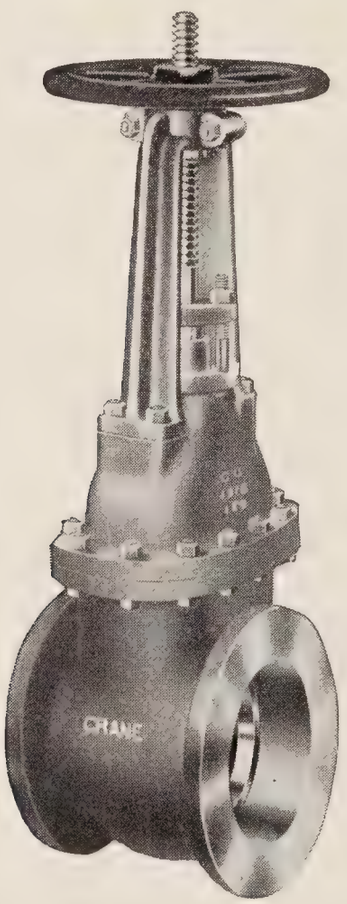
STANDARD
UNDERWRITERS' PATTERN
WEDGE GATE VALVES
WITH OUTSIDE SCREW AND YOKE

IRON BODY — BRASS TRIMMINGS — BRASS STEM

INCLUDING

BRASS GLAND FOLLOWER
BRASS BONNET BUSHING
BRASS GLAND NUTS

FOR WATER WORKING PRESSURES UP TO 150 POUNDS
TESTED TO 300 POUNDS HYDRAULIC PRESSURE



No. 467. FLANGED

CODE: CONORTIAR

Size.....Inches	2½	3	3½	4	5	6
Size.....Millimeters	64	76	90	100	125	150
Price.....Each	22.50	26.00	29.50	36.50	49.00	56.00
Size.....Inches	7	8	10	12	14	
Size.....Millimeters	175	200	250	300	350	
Price.....Each	73.00	90.00	136.00	180.00	255.00	

Screwed Valves will be made to order at the same price as Flanged.

These Valves are designed in accordance with the rules and requirements of the National Fire Protection Association.

These Valves are marked "CU" to denote their use for fire protection service.

The rising stem indicates whether the Valve is open, partly open or closed.

For general dimensions, see page 617.

Templates for drilling, page 596. Price List for drilling, page 483.

STANDARD

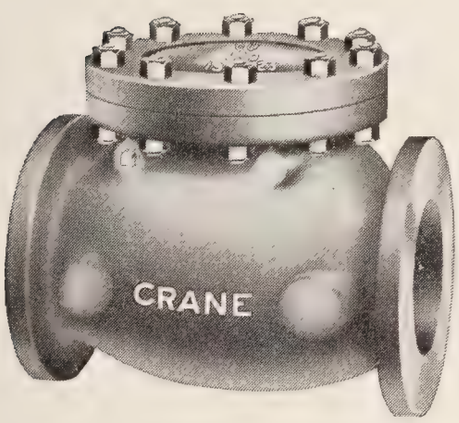
UNDERWRITERS' PATTERN

CLEARWAY SWING CHECK VALVES

IRON BODY BRASS TRIMMINGS

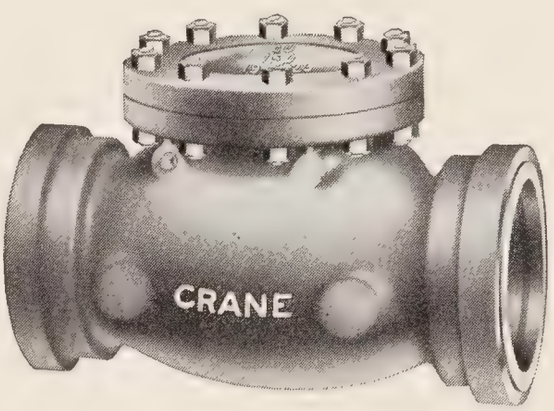
FOR WATER WORKING PRESSURES UP TO 150 POUNDS

TESTED TO 300 POUNDS HYDRAULIC PRESSURE PER SQUARE INCH



No. 375 FLANGED

CODE: CONRUSPOR



No. 375½ HUB

CODE: CONSIDETUR

Size.....Inches	2½	3	4	5	6	8	10	12
Size.....Millimeters	64	76	100	125	150	200	250	300
No. 375, Flanged..Each	14.50	17.00	24.00	34.00	41.00	75.00	115.00	168.00
No. 374½, Screwed, Ea.	14.50	17.00	24.00	34.00	41.00	75.00	115.00	168.00
No. 375½ Hub End, Ea.	14.50	17.00	24.00	34.00	41.00	75.00	115.00	168.00
Add for Leather Disc, Ea	1.50	2.00	3.00	4.00	4.00	7.50	10.00	12.00

These Valves are designed in accordance with the rules and requirements of the NATIONAL FIRE PROTECTION ASSOCIATION.

Valves are marked "CU" to denote their use for FIRE PROTECTION SERVICE.

Furnished in Flanged, Screwed and Hub End Patterns as required, and with BRASS FACED or LEATHER FACED disc as specified. Unless otherwise specified, BRASS FACED DISCS will be furnished.

These Valves are provided with bosses that may be tapped for by-pass when desired.

For general dimensions, see page 612.

Templates for drilling, page 596.

Price List for drilling, page 483.

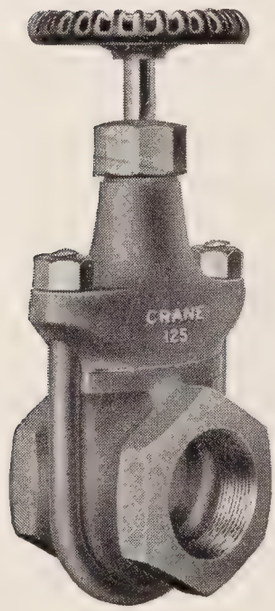
STANDARD

ALL-IRON OR BRASS MOUNTED

CLAMP GATE VALVES

WEDGE GATE — RISING STEM

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS

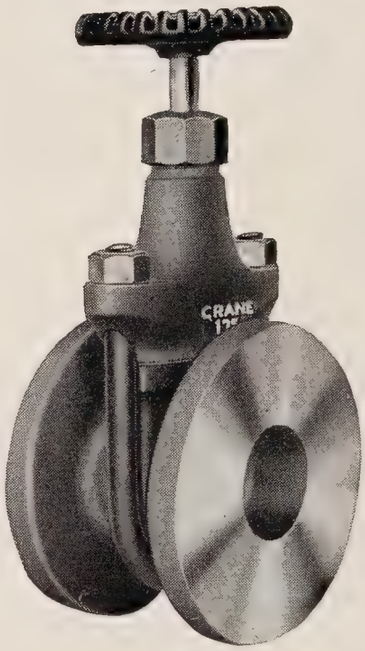


No. 488
SCREWED

CODE: CONSILIGO

THE ALL-IRON VALVE IS FOR USE WITH FLUIDS WHICH DESTROY BRASS AND BRONZE

THE IRON BODY, BRASS MOUNTED VALVE IS FOR USE IN SERVICE WHERE BRASS AND IRON COMBINATIONS ARE ACCEPTABLE



No. 488½
FLANGED

CODE: CONSITIVUS

Size.....Inches	½	¾	1	1¼	1½
Size.....Millimeters	13	19	25	32	38
No. 488 All-Iron, Screwed.....Each	2.00	2.35	2.50	3.50	5.00
No. 488½ All-Iron, Flanged.....Each			3.00	4.90	6.00
No. 490 Brass Mounted, Screwed. Each	2.00	2.35	2.50	3.50	5.00
No. 490½ Brass Mounted, Flanged. Each			3.00	4.90	6.00
Size.....Inches	2	2½	3	3½	4
Size.....Millimeters	50	64	76	90	100
No. 488 All-Iron, Screwed.....Each	7.50	12.00	15.00	18.00	20.00
No. 488½ All-Iron, Flanged.....Each	8.50	13.50	16.90	20.30	22.50
No. 490 Brass Mounted, Screwed. Each	7.50	12.00	15.00	20.00	22.00
No. 490½ Brass Mounted, Flanged. Each	8.50	13.50	16.90	22.00	25.00

These valves are recommended for use with compressed air and gasoline, as well as with steam, water, oil, etc.

These valves are extensively used in oil fields, gas fields, oil refineries, gas plants, benzol plants, mines, smelters, chemical plants, sugar plants, etc., in fact all classes of manufacturing plants.

These valves are inexpensive and serviceable and their construction is simple, durable and compact. The steel "clamp" which extends around the body of the valve and holds the bonnet securely in place may be easily removed, allowing free access to the interior of the valve for cleaning or repairing.

For quick opening clamp gate valves, see page 161.

For general dimensions, see page 667.

Templates for drilling, page 596.

Price list for drilling, page 483.

STANDARD
ALL-IRON OR BRASS MOUNTED
QUICK OPENING
CLAMP GATE VALVES

WEDGE GATE — RISING STEM

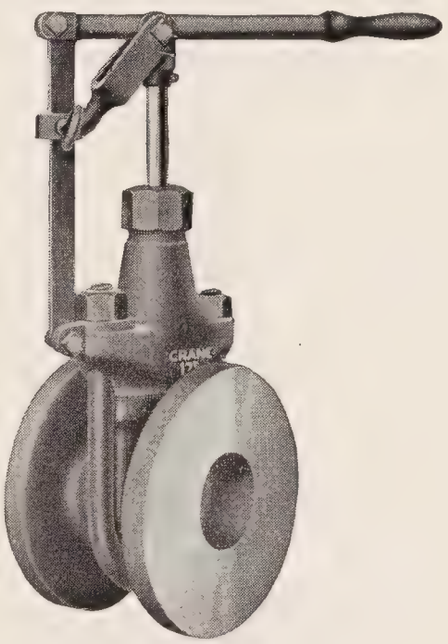
FOR STEAM WORKING PRESSURES UP TO 125 POUNDS

No. 492 SCREWED

CODE: CONSPIRARE

THE ALL-IRON VALVE IS FOR USE WITH FLUIDS WHICH DESTROY BRASS AND BRONZE.

THE IRON BODY, BRASS MOUNTED VALVE IS FOR USE IN SERVICE WHERE BRASS AND IRON COMBINATIONS ARE ACCEPTABLE.



NO. 492½ FLANGED

CODE: CONSPURQUE

Size.....Inches	½	¾	1	1¼	1½
Size.....Millimeters	13	19	25	32	38
No. 492, All-Iron Screwed.....Each	2.00	2.35	2.50	3.50	5.00
No. 492½, All-Iron Flanged.....Each			3.00	4.90	6.00
No. 494, Brass Mounted Screwed.....Each	2.00	2.35	2.50	3.50	5.00
No. 494½, Brass Mounted Flanged.....Each			3.00	4.90	6.00
Size.....Inches	2	2½	3	3½	4
Size.....Millimeters	50	64	76	90	100
No. 492, All-Iron, Screwed.....Each	7.50	12.00	15.00	18.00	20.00
No. 492½, All-Iron, Flanged.....Each	8.50	13.50	16.90	20.30	22.50
No. 494, Brass Mounted Screwed.....Each	7.50	12.00	15.00	22.00	24.00
No. 494½, Brass Mounted Flanged.....Each	8.50	13.50	16.90	24.00	27.50

These Valves are recommended for use with compressed air and gasoline, as well as with steam, water, oil, etc.

These Valves are extensively used in Oil Fields, Gas Fields, Oil Refineries, Gas Plants, Benzol Plants, Mines, Smelters, Chemical Plants, Sugar Plants, etc., in fact, in all classes of Manufacturing Plants.

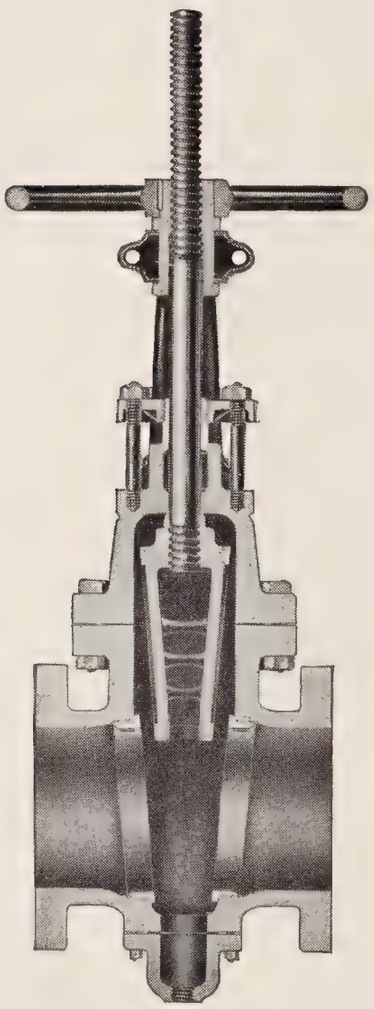
These Valves are inexpensive and serviceable and their construction is simple, durable and compact. The steel "clamp" which extends around the body of the Valve and holds the bonnet securely in place may easily be removed, allowing free access to the interior of the Valve for cleaning or making repairs.

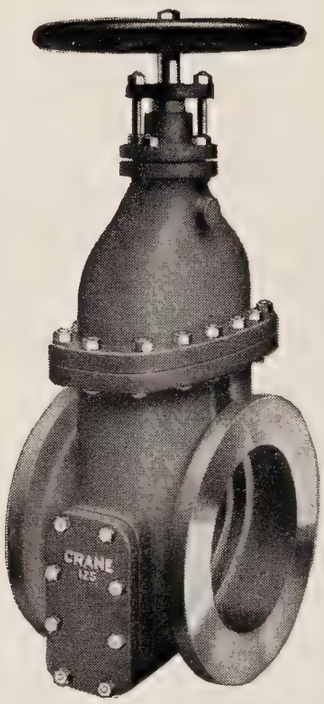
For General Dimensions see page 667.

Templates for Drilling page 596.

Price List for Drilling page 483.

GATE VALVES WITH CLEAN-OUT POCKET





THESE VALVES HAVE REMOVABLE CLEAN-OUT POCKET

To clean the valve it is unnecessary to remove it from the line or take valve apart; simply remove Clean-Out Pocket, when free access to interior of valve is allowed.

The following valves can be furnished with Clean-Out Pocket:

Medium Wedge Gate Valves, pages 164 to 166.

Extra Heavy Wedge Gate Valves, pages 168 to 171.

PRICES ON APPLICATION

MEDIUM
WEDGE GATE VALVES

FERROSTEEL BODY **CRANE SPECIAL BRASS SEATS**

FOR STEAM AND WATER WORKING PRESSURES, ACCORDING TO SIZE, VIZ.:

STEAM { SIZES 16 INCH AND SMALLER, UP TO 175 POUNDS
SIZES 18 INCH AND LARGER, UP TO 150 POUNDS

WATER { SIZES 12 INCH AND SMALLER, UP TO 250 POUNDS
SIZES 14 INCH AND LARGER, UP TO 200 POUNDS

TESTED TO 500 POUNDS HYDRAULIC PRESSURE PER SQUARE INCH

BURSTING PRESSURES

The actual hydraulic pressure required to burst Ferrosteel Medium Gate Valves, is:

Sizes	Pounds	Sizes	Pounds	Size	Pounds
4 to 8 inch	1900 to 2600	14 inch	O. K. at 1000	18 inch	O. K. at 700
10 and 12 inch	1400 to 1500	16 inch	O. K. at 750		

In setting the above working pressure we have used a factor of safety conservatively high; however, it is not a question of pressure, alone, but the Valves must stand, without distortion, the strains incident to expansion and contraction, settling of pipe lines and a possible moderate water hammer.

The Body of these Valves, all sizes, is made of Ferrosteel. The Bonnet is made of Ferrosteel in sizes 8 inch and larger.

Their construction is similar to the Standard, except that they are much heavier, and were designed for steam plants carrying pressures up to 175 pounds (sizes 16 inch and smaller), and will be found a very serviceable Valve for the purpose intended.

The Stem in the Valve with inside screw is made of Brass and in the Valve with outside screw and yoke is made of Steel, Plated. Brass Stem for the latter Valves will be furnished at an extra price.

The gland flange on these Valves is made of Malleable Iron, with brass gland screwed in, which gives the requisite strength and durability at this point.

Each Valve is tested to 500 pounds hydraulic pressure before leaving the factory

It is desirable that all Valves 6 inch and larger have a By-Pass.

These Valves are so constructed that when wide open they may be repacked while under pressure.

See explanatory cuts on page 149.

Unless otherwise specified, we will always furnish our Medium Flanged Valves, also our Extra Heavy Companion Flanges with $\frac{1}{16}$-inch raised face, for which we make no extra charge.

Any type of gasket can be fitted to this style of face, and it is especially necessary where a thin corrugated copper gasket is used, as this gasket draws down to $\frac{1}{32}$ inch or less and the heavy bolting would (without the raised face) spring the flanges until the edges touch, without putting sufficient pressure upon the gasket.

THE MERITS OF CRANE METALS ARE DESCRIBED ON PAGE 2

MEDIUM
WEDGE GATE VALVES

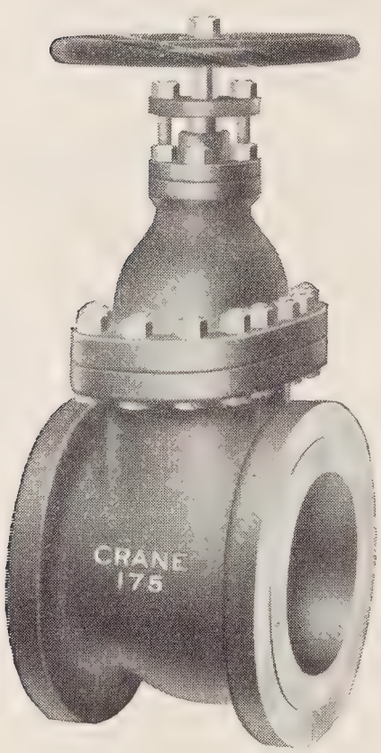
PATENTED

FERROSTEEL BODY NON-RISING STEM CRANE SPECIAL BRASS SEATS

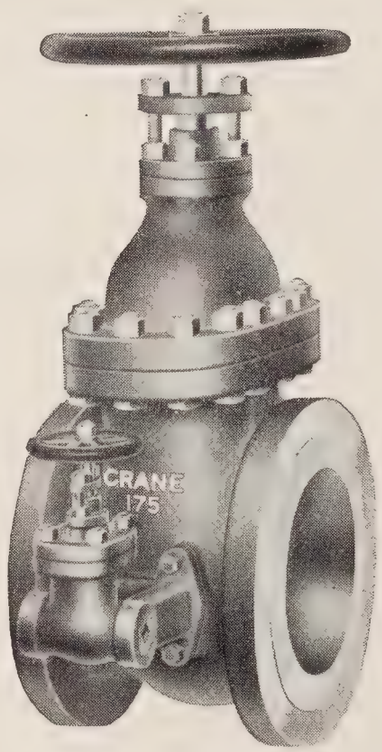
FOR STEAM AND WATER WORKING PRESSURES, ACCORDING TO SIZE, VIZ:

STEAM { SIZES 16 INCH AND SMALLER . UP TO 175 POUNDS
SIZE 18 INCH . . . . . UP TO 150 POUNDS
WATER { SIZES 12 INCH AND SMALLER . UP TO 250 POUNDS
SIZES 14 INCH AND LARGER . UP TO 200 POUNDS

TESTED TO 500 POUNDS HYDRAULIC PRESSURE PER SQUARE INCH



No. 501
CODE: CONTORTULA



No. 503
CODE: CONTRUNCAM

Size	Inches	2	2½	3	3½	4
Size	Millimeters	50	64	76	90	100
No. 500, Screwed	Each	15.00	17.00	20.00	25.00	28.00
No. 501, Flanged	Each	17.50	19.50	23.00	28.00	33.00
Size	Inches	4½	5	6	7	
Size	Millimeters	113	125	150	175	
No. 500, Screwed	Each	35.00	40.00	50.00	75.00	
No. 501, Flanged	Each	40.00	45.00	57.00	82.00	
No. 503, Flanged	Each			85.00	110.00	
Size	Inches	8	9	10	12	
Size	Millimeters	200	225	250	300	
No. 500, Screwed	Each	87.00	120.00	145.00	185.00	
No. 501, Flanged	Each	94.00	127.00	153.00	195.00	
No. 503, Flanged	Each	125.00	158.00	185.00	230.00	
Size	Inches	14	15	16	18	
Size	Millimeters	350	375	400	450	
No. 501, Flanged	Each	300.00	350.00	400.00		
No. 503, Flanged	Each	340.00	390.00	450.00	575.00	

On installations larger than 6 inches, we recommend that Flanged Valves be used.

WE HAVE PATTERNS AND CAN FURNISH PROMPTLY, SIZES UP TO AND INCLUDING 24 INCH

PRICES ON APPLICATION

For general dimensions, see page 619.
Templates for drilling, page 598. Price List for drilling, page 484.

MEDIUM

WEDGE GATE VALVES

PATENTED

FERROSTEEL BODY — **CRANE SPECIAL BRASS SEATS**

OUTSIDE SCREW AND YOKE

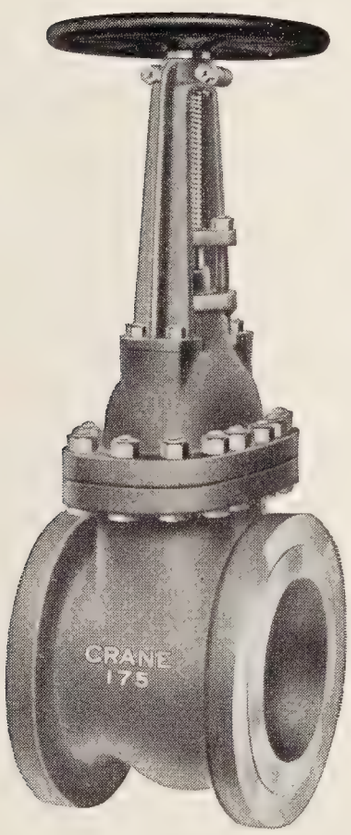
OPEN TO THE LEFT

FOR STEAM AND WATER WORKING PRESSURES, ACCORDING TO SIZE, VIZ;

STEAM { SIZES 16 INCH AND SMALLER . UP TO 175 POUNDS
SIZES 18 INCH AND LARGER . UP TO 150 POUNDS

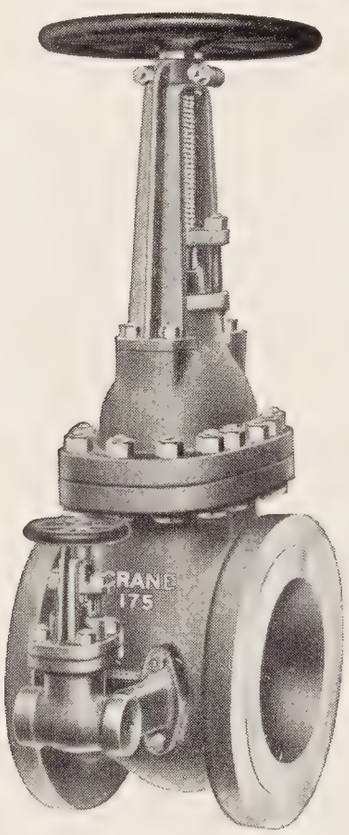
WATER { SIZES 12 INCH AND SMALLER . UP TO 250 POUNDS
SIZES 14 INCH AND LARGER . UP TO 200 POUNDS

TESTED TO 500 POUNDS HYDRAULIC PRESSURE PER SQUARE INCH



No. 505

CODE: COPEPODAN



No. 507

CODE: COPULANDIS

Size.....Inches	2	2½	3	3½	4	4½	5	6	7	8
Size.....Millimeters	50	64	76	90	100	113	125	150	175	200
No. 504, Screwed.....Each	23.00	25.00	29.00	35 00	40 00	50.00	54.00	65.00	90.00	110.00
No. 505, Flanged.....Each	25.50	27.50	32.00	38.00	45.00	55.00	59.00	72.00	97.00	117.00
No. 507, Flanged.....Each								100.00	125.00	148.00

Size.....Inches	9	10	12	14	15	16	18	20	24	
Size.....Millimeters	225	250	300	350	375	400	450	500	600	
No. 504, Screwed.....Each	145.00	170.00	215.00							
No. 505, Flanged.....Each	152.00	178.00	225.00	340.00	400.00	450.00	600.00	775.00	1175.00	
No. 507, Flanged.....Each	183.00	210.00	260.00	390.00	450.00	510.00	660.00	850.00	1250.00	

The Rising Stem indicates whether the Valve is open, partly open or closed.

On installations larger than 6 inches we recommend that Flanged Valves be used.

For general dimensions, see page 619.

Templates for drilling, page 598. Price List for drilling, page 484.

MEDIUM

WEDGE GATE ANGLE VALVES

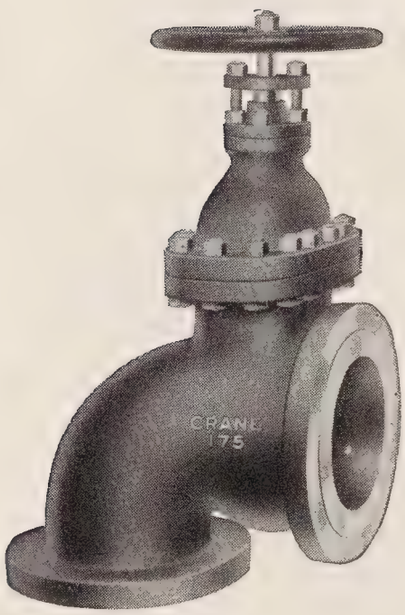
FERROSTEEL BODY

CRANE SPECIAL BRASS SEATS

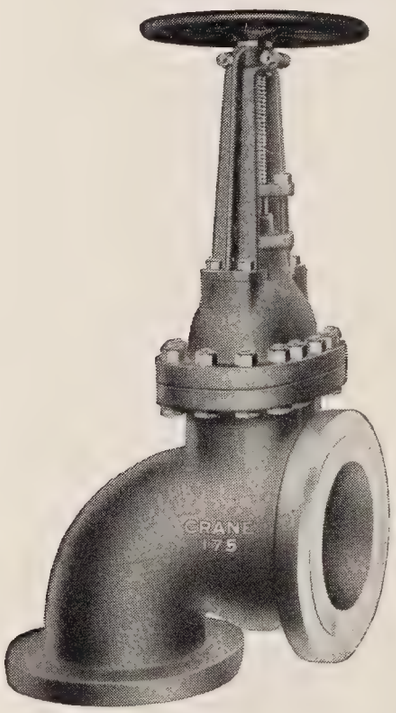
FOR STEAM AND WATER WORKING PRESSURES, ACCORDING TO SIZE, VIZ.:

STEAM—Sizes 12 Inch and Smaller, Up to 175 Pounds.
WATER—Sizes 12 Inch and Smaller, Up to 250 Pounds.

TESTED TO 500 POUNDS HYDRAULIC PRESSURE PER SQUARE INCH



No. 511
NON-RISING STEM
CODE: COQUENTIA



No. 513
OUTSIDE SCREW AND YOKE
CODE: CORALLISCH

Size.....Inches	4	5	6	7	8	9	10	12
Size.....Millimeters	100	125	150	175	200	225	250	300
No. 511, Price.....Each	65.00	85.00	100.00	130.00	150.00	195.00	225.00	300.00
No. 513, Price.....Each	77.00	100.00	115.00	145.00	175.00	220.00	250.00	330.00

These Valves will be furnished, screwed, at a special price. Other sizes than those listed, prices on application.

When so specified, 6-inch and larger Valves can be fitted with By-Pass.

For general dimensions, see page 619.

Templates for drilling, page 598. Price List for drilling, page 484.

EXTRA HEAVY

WEDGE GATE VALVES

FERROSTEEL **HARD METAL SEATS**

FOR SATURATED STEAM WORKING PRESSURES UP TO 250 POUNDS

FOR SUPERHEATED STEAM WORKING PRESSURES UP TO 250 POUNDS AND A TOTAL TEMPERATURE NOT TO EXCEED 500 DEGREES FAHR.

FOR WATER WORKING PRESSURES·
SIZES 8 INCH AND SMALLER, UP TO 400 POUNDS
SIZES 9 TO 12 INCH INCLUSIVE, UP TO 350 POUNDS
SIZES 14 INCH AND LARGER, UP TO 300 POUNDS

These Valves are tested to 800 pounds hydraulic pressure per square inch with the Valve open, and are also tested with the Valve closed and the pressure against the disc to 500 pounds hydraulic pressure. We have at various times subjected them to a hydraulic pressure with the Valve closed and the pressure against the disc as follows:

Size:	1¼ to 8 inch.	10 to 14 inch.	16 and 18 inch.	20 to 24 inch.
Tight at	1300 pounds.	900 pounds.	800 pounds.	600 pounds.

It will be observed that all sizes up to and including 18 inch are tight with a pressure of 800 pounds against the disc. The 20 inch, 22 inch and 24 inch Valves are tight against 600 pounds, which is as heavy a strain as a Valve of these sizes should be subjected to.

BURSTING PRESSURES

The Bodies, Bonnets and Yokes on Extra Heavy Wedge Gate Valves are made of Ferrosteel, and the actual hydraulic pressure required to burst them is:

Size 4 to 8 inch	2450 to 2600 pounds
Size 10 and 12 inch	1750 to 1900 pounds
Size 14 to 16 inch	1200 to 1350 pounds
Size 18 inch	O. K. at 850
Size 20 to 24 inch	O. K. at 600.

In setting the working pressure at 250 pounds per square inch, we have used a factor of safety conservatively high; however, it is not a question of pressure alone, but the Valves must stand without distortion, the strains incident to expansion and contraction, settling of pipe lines and a possible moderate water hammer.

CONSTRUCTION

The body is very heavy and has extra heavy hard metal seats which are screwed to shoulders in body, thereby insuring perfect joints.

The disc is made very stiff and faced with hard metal. The guides in the disc are carefully finished so as to slide smoothly on ribs in body, thus preventing any rattling or uneven wear of the faces when Valve is partly open.

The stem in the Valve with inside screw is made of Crane Stem Metal, and in the Valve with outside screw and yoke is made of Steel, and plated, or of Brass, as ordered.

The gland flange on these Valves is made of Malleable Iron with a brass Gland screwed in, which gives the requisite strength and durability at this point.

These Valves are so constructed that when wide open they may be repacked while under pressure.

See explanatory cuts on page 168.

Hard Metal is the very best material that can be made to stand the wear which the seats of these Valves are subjected to.

THE MERITS OF CRANE METALS ARE DESCRIBED ON PAGE 2

EXTRA HEAVY

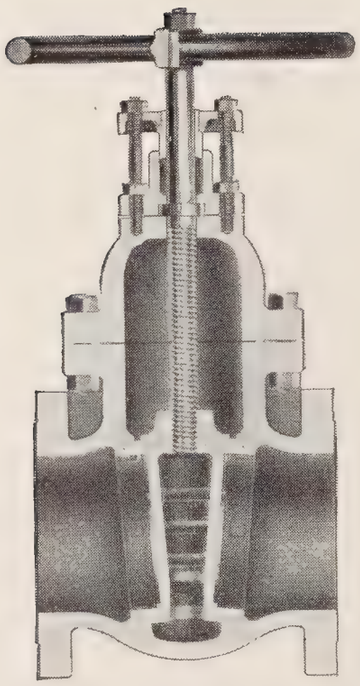
WEDGE GATE VALVES

FERROSTEEL HARD METAL SEATS

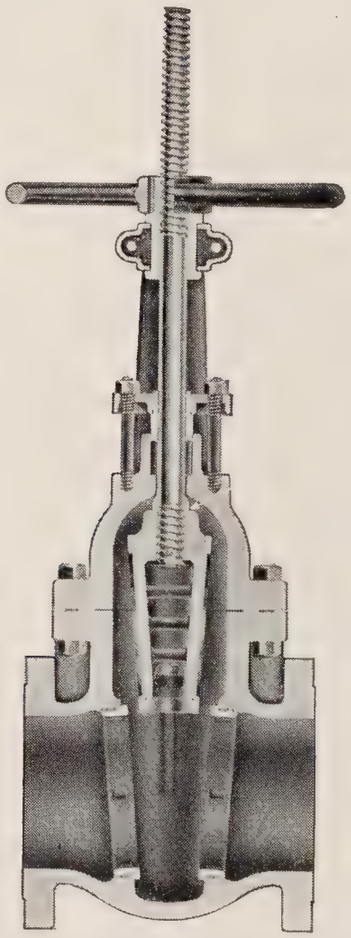
FOR SATURATED STEAM WORKING PRESSURES UP TO 250 POUNDS

FOR SUPERHEATED STEAM WORKING PRESSURES UP TO 250 POUNDS AND A TOTAL TEMPERATURE NOT TO EXCEED 500 DEGREES FAHR.

FOR WATER WORKING PRESSURES:
SIZES 8 INCH AND SMALLER, UP TO 400 POUNDS
SIZES 9 INCH TO 12 INCH, INCLUSIVE, UP TO 350 POUNDS
SIZES 14 INCH AND LARGER, UP TO 300 POUNDS
TESTED TO 800 POUNDS HYDRAULIC PRESSURE PER SQUARE INCH



No. 3 E
NON-RISING STEM



No. 7 E
OUTSIDE SCREW AND YOKE

THESE VALVES MAY BE REPACKED WHILE UNDER PRESSURE AS FOLLOWS:

Non-Rising Stem Valves—Open the Valve full to jam disc against top of bonnet, thus drawing the collar on the stem tightly against a machined surface on the bonnet, forming a tight joint.

Outside Screw and Yoke Valves—Open the Valve full so the tapered collar on the stem (indicated by arrow) is seated into a machined surface in the bonnet, forming a tight joint.

Unless otherwise specified, we will always furnish our Extra Heavy Flanged Valves, also our Extra Heavy Companion Flanges with $\frac{1}{16}$ inch raised face, for which we make no extra charge. Any type of gasket can be fitted to this style of face and it is especially necessary where a thin corrugated copper gasket is used. This gasket draws down to $\frac{1}{32}$ inch or less and the heavy bolting will spring the flanges until the edges touch, without putting sufficient pressure upon the gasket.

EXTRA HEAVY

WEDGE GATE VALVES

NON-RISING STEM

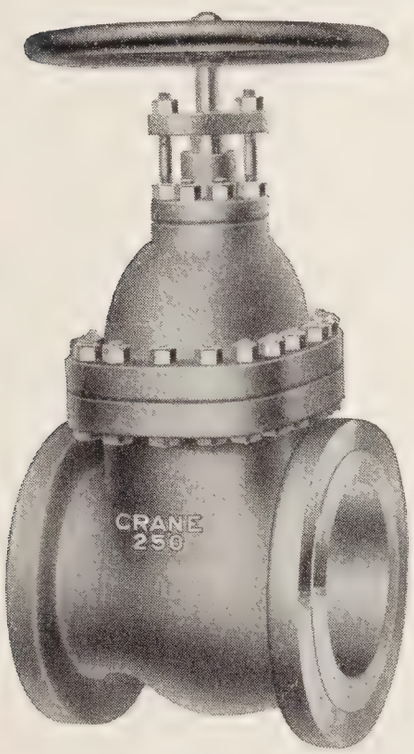
FERROSTEEL HARD METAL SEATS

FOR SATURATED STEAM WORKING PRESSURES UP TO 250 POUNDS

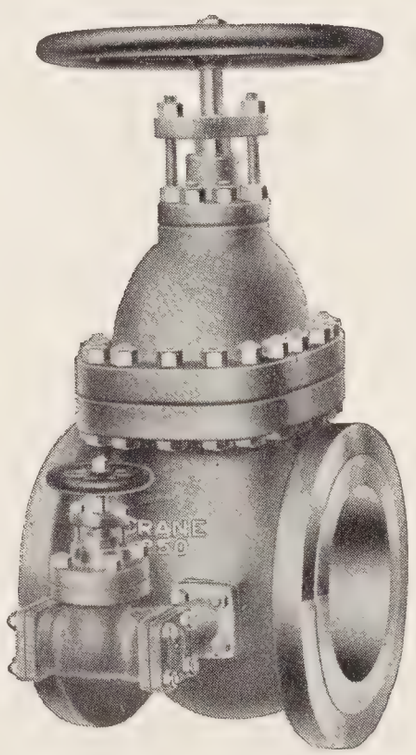
FOR SUPERHEATED STEAM WORKING PRESSURES UP TO 250 POUNDS AND A TOTAL TEMPERATURE NOT TO EXCEED 500 DEGREES FAHR.

TESTED TO 800 POUNDS HYDRAULIC PRESSURE PER SQUARE INCH

FOR WATER WORKING PRESSURES SEE PAGE 167



No. 3E
CODE: CORDOJOSAS



No. 5E
CODE: CORNAQUINO

Size	Inches	1¼	1½	2	2½	3	3½
Size	Millimeters	32	38	50	64	76	90
No. 2E, Screwed	Each	24.00	25.00	27.50	33.00	45.00	57.00
No. 3E, Flanged	Each	26.50	27.50	30.00	35.50	48.00	60.00
Size	Inches	4	4½	5	6	7	8
Size	Millimeters	100	113	125	150	175	200
No. 2E, Screwed	Each	60.00	77.00	85.00	100.00	125.00	155.00
No. 3E, Flanged	Each	65.00	82.00	90.00	107.00	132.00	162.00
No. 5E, Flanged	Each				155.00		215.00
Size	Inches	9	10	12	14	15	16
Size	Millimeters	225	250	300	350	375	400
No. 2E, Screwed	Each	225.00	250.00				
No. 3E, Flanged	Each	232.00	258.00	335.00	440.00	540.00	675.00
No. 5E, Flanged	Each		310.00	400.00			

It is desirable that all Valves, 6 inch and larger, have a By-Pass. On installations larger than 6 inches we recommend that Flanged Valves be used.

For general dimensions, see page 621.
Templates for drilling, page 598. Price List for drilling, page 484.

EXTRA HEAVY

WEDGE GATE VALVES

OUTSIDE SCREW AND YOKE

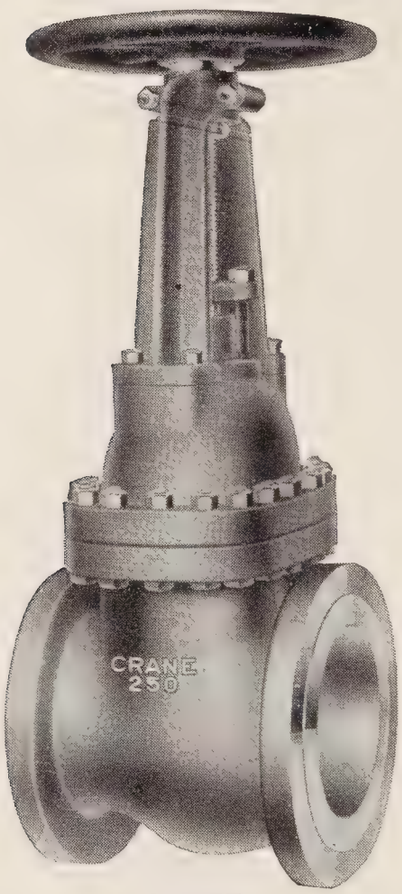
FERROSTEEL PATENTED HARD METAL SEATS

FOR SATURATED STEAM WORKING PRESSURES UP TO 250 POUNDS

FOR SUPERHEATED STEAM WORKING PRESSURES UP TO 250 POUNDS AND A TOTAL TEMPERATURE NOT TO EXCEED 500 DEGREES FAHR.

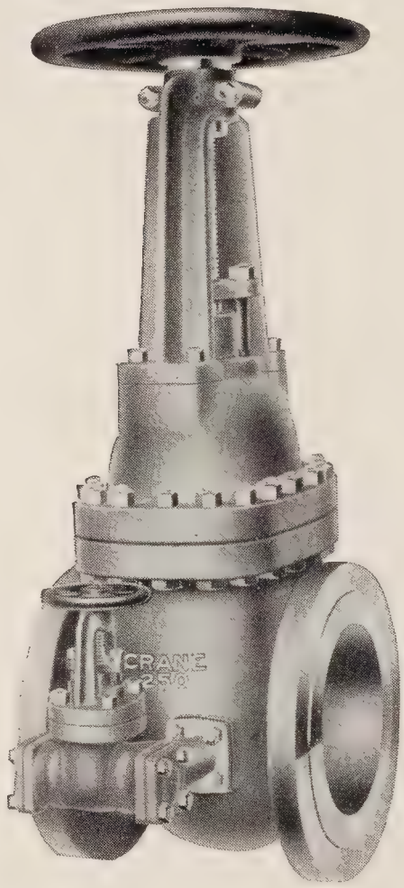
TESTED TO 800 POUNDS HYDRAULIC PRESSURE PER SQUARE INCH

FOR WATER WORKING PRESSURES, SEE PAGE 167



No. 7E

CODE: COTEGUGNO



No. 9E

CODE: CRABRONEM

Size.....Inches	1¼	1½	2	2½	3	3½	4	4½	5
Size....Millimeters	32	38	50	64	76	90	100	113	125
No. 6E, Scrd., Steel Stem, Each			35.50	41.00	54.00		72.00		100.00
No. 7E, Flngd., Steel Stem, Each	34.50	35.50	38.00	43.50	57.00	70.00	77.00	97.00	105.00
No. 7½E, Flngd., Brass Stem, Ea.			41.00	47.00	61.00	75.00	83.00	104.00	113.00
No. 9E, Flngd., Steel Stem, Each									153.00

Size.....Inches	6	7	8	9	10	12	14	15	16
Size....Millimeters	150	175	200	225	250	300	350	375	400
No. 7E, Flngd., Steel Stem . Ea.	122.00	147.00	187.00	257.00	283.00	390.00	510.00	610.00	750.00
No. 7½E, Flngd., Brass Stem, Ea.	131.00	158.00	201.00	276.00	305.00	420.00			
No. 9E, Flngd., Steel Stem . Ea.	170.00	195.00	240.00	310.00	335.00	455.00	580.00	680.00	825.00

Size.....Inches	18	20	24			
Size.....Millimeters	450	500	600			
No. 9 E, Flanged, Steel Stem . . Each	1050.00	1250.00	1700.00			

It is desirable that all Valves, 6 inch and larger, have a By-Pass. On installations larger than 6 inches we recommend that Flanged Valves be used.

The outside screw indicates whether the Valve is open, partly open or closed. For general dimensions, see page 621.

Templates for drilling, page 598. Price List for drilling, page 484.

EXTRA HEAVY

ANGLE GATE VALVES

RISING AND NON-RISING STEM

FERROSTEEL WEDGE GATE HARD METAL SEATS

FOR SATURATED STEAM WORKING PRESSURES UP TO 250 POUNDS

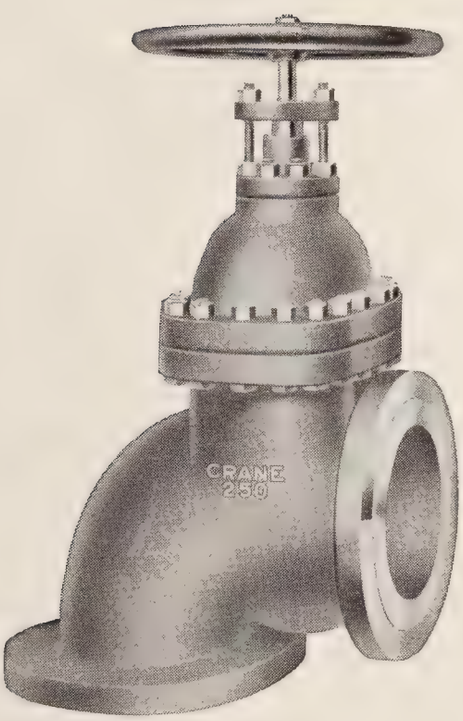
FOR SUPERHEATED STEAM WORKING PRESSURES UP TO 250 POUNDS AND A TOTAL TEMPERATURE NOT TO EXCEED 500 DEGREES FAHR.

FOR WATER WORKING PRESSURES:

SIZES 8-INCH AND SMALLER, UP TO 400 POUNDS

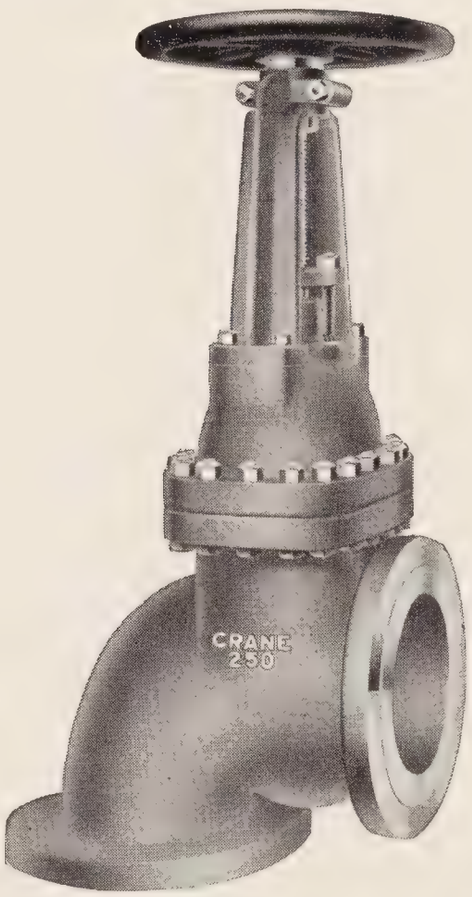
SIZES 9 AND 10-INCH UP TO 350 POUNDS

TESTED TO 800 POUNDS HYDRAULIC PRESSURE PER SQUARE INCH



No. 11E

CODE: CUADRADURA



No. 12E

CODE: CUBREPIATO

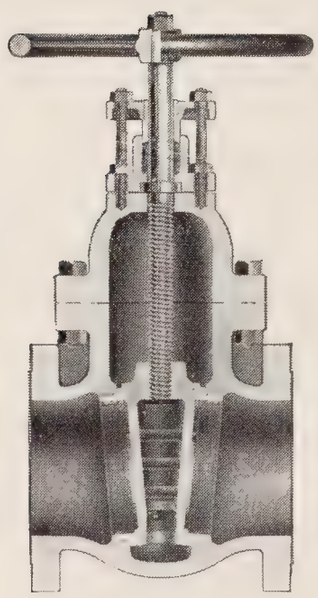
Size.....Inches	5	6	7	8	9	10
Size.....Millimeters	125	150	175	200	225	250
No. 11 E, Flanged.....Each	140.00	175.00	210.00	250.00	325.00	375.00
No. 11 E, Flanged, with By-Pass Each		225.00	260.00	300.00	375.00	430.00
No. 12 E, Flanged.....Each	155.00	190.00	225.00	275.00	350.00	400.00
No. 12 E, Flanged, with By-Pass Each				325.00	400.00	455.00

NOTE: IN ORDERING VALVES WITH BY-PASS, STATE WHETHER THE BY-PASS IS TO BE LOCATED ON THE RIGHT OR LEFT HAND SIDE, VIEWED FROM THE FACE OF SIDE OPENING.

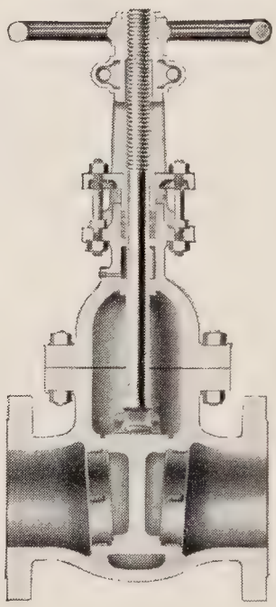
The above Valves are made to order only.
Prices of other sizes furnished on application.
For general dimensions, see page 621.
Templates for drilling, page 598. Price List for drilling, page 484.

EXTRA HEAVY

CAST STEEL GATE VALVES



No. 3 STEEL
NON-RISING STEM



No. 7 STEEL
OUTSIDE SCREW AND YOKE

GENERAL SPECIFICATIONS

CLASS AA — **350 LBS. STEAM WORKING PRESSURE—800° F. TOTAL TEMPERATURE.**
Cast Steel Body, Bonnet, Yoke and Disc. Sizes 2½-inch and larger, discs are faced with Monel Metal; 2-inch and smaller, solid Monel Metal Discs. Monel Metal Seats. Monel Metal Stem.

STEEL BOLTS OF HIGH TENSILE STRENGTH or commercial bolts larger in diameter must be used on the end flanges when valves are subjected to steam working pressure in excess of 300 lbs.

A. S. M. E. EXTRA HEAVY BOLTING using commercial bolts is not strong enough for steam working pressures in excess of 300 lbs.

CLASS A — **300 LBS. STEAM WORKING PRESSURE—800° F. TOTAL TEMPERATURE.**
Cast Steel Body, Bonnet, Yoke and Disc. Sizes 2½-inch and larger, discs are faced with Monel Metal; 2-inch and smaller, solid Monel Metal Discs. Monel Metal Seats. Monel Metal Stem.

CLASS B — **300 LBS. STEAM WORKING PRESSURE—800° F. TOTAL TEMPERATURE.**
Cast Steel Body, Bonnet, Yoke and Disc. Sizes 2½-inch and larger, discs are faced with Monel Metal; 2-inch and smaller, solid Monel Metal Discs. Monel Metal Seats. Rolled Steel Stem.

CLASS H — **500-POUND COLD WATER WORKING PRESSURE AND 400-POUND BOILER FEED LINES.**
Cast Steel Body, Bonnet, Yoke and Disc. Sizes 2½-inch and larger, discs are faced with Hard Metal; 2-inch and smaller, solid Hard Metal Discs. Hard Metal Seats. Rolled Brass Stem.

All valves furnished with 1/16-inch raised face. For diameters see page 665.

In ordering, always specify by NUMBER and LETTER denoting the combination wanted.

EXTRA HEAVY

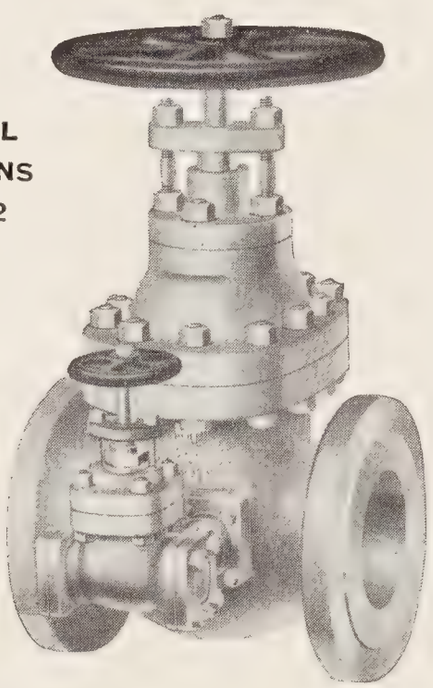
CAST STEEL GATE VALVES

WEDGE GATE **NON-RISING STEM** **OPEN TO THE LEFT**

FOR 500 POUNDS COLD WATER WORKING PRESSURE AND 400-POUND BOILER FEED LINES.

No. 3 H
CODE: CUMINAMIDE

FOR GENERAL SPECIFICATIONS SEE PAGE 172



No. 5 H
WITH BY-PASS
(PATENTED)
CODE: CUPIDETTO

Size.....Inches	1¼	1½	2	2½	3	3½	4	4½
Size.....Millimeters	32	38	50	64	76	90	100	113
No. 3-H, Flanged. Each	42.50	45.00	49.00	60.00	74.00	88.00	100.00	115.00
Size.....Inches	5	6	7	8	9	10	12	
Size.....Millimeters	125	150	175	200	225	250	300	
No. 3-H, Flanged. Each	125.00	145.00	175.00	205.00	255.00	315.00	380.00	
No. 5-H, Flgd. with By-Pass Ea.		190.00		250.00		365.00	445.00	

All Valves 6 inches or larger should have a by-pass.

For general specifications, see page 172. For general dimensions, see page 623.

For drilling templates, see page 598. Price List for drilling, see page 485.

Valves are regularly furnished with a raised face 1/16 inch high. For diameters see page 665.

EXTRA HEAVY

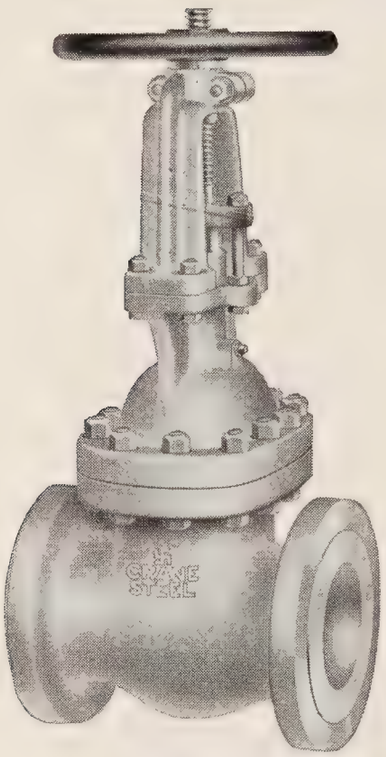
CAST STEEL GATE VALVES

OUTSIDE SCREW AND YOKE

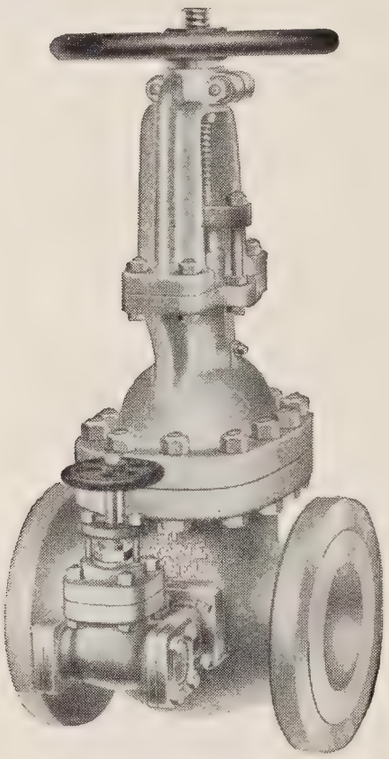
WEDGE GATE (PATENTED) OPEN TO THE LEFT

WITH AND WITHOUT BY-PASS

FOR WORKING PRESSURES, AND GENERAL SPECIFICATIONS SEE PAGE 172



No. 7 STEEL
CODE: CUPOLIFERO



No. 9 STEEL
CODE: DAPATICAL

Size.....Inches	1¼	1½	2	2½	3	3½	4	4½	5
Size.....Millimeters	32	38	50	64	76	90	100	113	125
No. 7 A, Flg'd..Each	50.00	52.50	57.50	70.00	85.00	100.00	115.00	130.00	145.00
No. 7 B, Flg'd..Each	45.00	47.50	50.00	62.50	75.00	90.00	105.00	120.00	135.00
No. 7 H, Flg'd..Each	45.00	47.50	51.50	62.50	77.00	92.00	105.00	120.00	130.00

Size.....Inches	6	7	8	9	10	12	14	15	16
Size.....Millimeters	150	175	200	225	250	300	350	375	400
No. 7 A, Flg'd..Each	170.00	210.00	245.00	310.00	375.00	475.00	625.00	625.00	800.00
No. 7 B, Flg'd..Each	155.00	190.00	225.00	285.00	340.00	435.00	560.00	560.00	720.00
No. 7 H, Flg'd..Each	150.00	185.00	215.00	265.00	330.00	400.00	530.00	530.00	665.00

Size.....Inches	6	7	8	9	10	12
Size.....Millimeters	150	175	200	225	250	300
No. 9 A, Flanged, with By-Pass..Each	225.00	265.00	300.00	365.00	440.00	560.00
No. 9 B, Flanged, with By-Pass..Each	205.00	240.00	275.00	335.00	400.00	515.00
No. 9 H, Flanged, with By-Pass..Each	200.00	235.00	265.00	320.00	385.00	470.00

Size.....Inches	14	15	16	18	20	24
Size.....Millimeters	350	375	400	450	500	600
No. 9 A, Flanged, with By-Pass..Each	710.00	710.00	885.00	1200.00	1500.00	2250.00
No. 9 B, Flanged, with By-Pass..Each	640.00	640.00	800.00	1100.00	1350.00	2050.00
No. 9 H, Flanged, with By-Pass..Each	600.00	600.00	735.00	1025.00	1250.00	1900.00

All Valves 6 inches and larger should have a by-pass.

For general specifications, see page 172. For general dimensions, see page 623. For drilling templates, see page 598. Price List for drilling, see page 485.

Valves are regularly furnished with a raised face $\frac{1}{16}$ inch high. For diameters see page 665.

HYDRAULIC

VALVES AND FITTINGS

We manufacture three lines of Hydraulic Wedge Gate Valves and fittings built to the American Hydraulic Standards for cold water or oil working pressures, 800 to 3000 pounds. We illustrate and list in this catalogue the ferrosteel 800 pound line only. For the cast steel lines 1200 and 3000 pounds see our Steel Catalogue.

We manufacture Malleable Iron, Cast Steel and Forged Steel Hydraulic Screwed Fittings covering a range of working pressures up to 6000 pounds per square inch Hydrostatic.

We manufacture Brass, Forged Steel and Cast Steel Screwed Valves covering a range of working pressures up to 6000 pounds per square inch Hydrostatic.

In addition to the ordinary types of valves and fittings, we manufacture various specialties which are used to a considerable extent in Hydraulic Pipe Lines, such as Water Relief Valves, Sediment Separators and Shock Absorbers.

We are adding to our line as demand warrants and furnish material not shown in this catalogue if ordered in sufficient quantities. We have endeavored to build material to cover the requirements of ordinary hydraulic work. Material for HIGH TEMPERATURES or UNUSUAL CONDITIONS should be taken up as a SPECIAL PROPOSITION and we will endeavor to take care of any requirements.

HYDROSTATIC AND SHOCK WORKING PRESSURES

All valves and fittings in this catalogue are suitable for the working pressures specified when used in hydraulic installations in which shock is absent or negligible and where the temperature does not exceed 100 degrees Fahrenheit.

It is well known that in certain classes of hydraulic installations where quick operating valves are used, such as hydraulic forging plants, steel mill operating systems, etc., the piping is subjected to more or less SHOCK because of the sudden operation of valves. Service of this character is sometimes very severe on the valves and fittings, and though the use of properly designed Shock Absorbers at various points will reduce the over-pressure, it is usually necessary to use heavier valves and fittings than would be required for an installation where shock is absent.

Ordinarily, hydraulic valves and fittings subject to shock should not be used for working pressures higher than 65 per cent of the "Hydrostatic" working pressure ratings published, and where shock is severe 50 per cent or even 40 per cent will be more conservative. Installations of this character should always be protected by Shock Absorbers, placed to the best advantage.

AIR AND GAS

Our Hydraulic Valves and Fittings may be used on High Pressure Air or Natural Gas service up to the Hydrostatic Working Pressure published, providing the temperature does not exceed 100 degrees Fahrenheit.

However, material for this service should always be ordered special, because WHEN SO ORDERED, it is given a high pressure air-under-water test in addition to the usual hydraulic test. An additional charge is made for this test.

We cannot be responsible for valves or fittings used on air or gas, unless THE ORDER SPECIFIES THAT THEY ARE FOR SUCH SERVICE.

Valves and Fittings for High Pressure Air or Gas where the temperature exceeds 100 degrees Fahrenheit are entirely special. Orders or inquiries for prices should give complete information regarding service conditions.

Ordinary Hydraulic Check Valves will not give satisfactory service on High Pressure Air or Gas. Valves for this service will be furnished with special construction. Prices on application.

800 POUND
AMERICAN HYDRAULIC STANDARD

FERROSTEEL WEDGE GATE VALVES

HARD METAL (BRONZE) SEATS

FOR 800 POUNDS COLD WATER OR OIL WORKING PRESSURES

TESTED TO 2000 POUNDS HYDRAULIC PRESSURE PER SQUARE INCH

CONSTRUCTION

The bodies, bonnets and yokes of these Valves are made of Ferrosteel.

The stem in the Non-Rising Stem Valve is made of Brass; in the Valve with Outside Screw and Yoke it is made of Steel and plated.

Brass stems for the Outside Screw and Yoke Valves will be furnished at an extra price.

The body is very heavy and has extra heavy hard metal seats which are screwed against shoulders in the body, thereby insuring perfect joints.

This construction of seat and method of screwing it into the body is very much better than any other, as there is no necessity of an auxiliary gland to keep the seats in an exact line and no trouble with leaks between the seat and the body which are likely to occur in other styles. These seats can be removed at any time should it be found necessary to renew them.

The gate is made very rigid and faced with hard metal. The guides in the gate are very carefully finished so as to slide smoothly on ribs in the body, thus preventing any rattling when Valve is partly open or any uneven wear of the faces.

The stuffing box gland flange on all these Valves is made of Malleable Iron with a brass follower, which gives the requisite additional strength and durability at this point.

Hard Metal is a superior metal and will withstand the wear that the seats of these Valves are subjected to.

The Outside Screw and Yoke, with its Rising Stem, is a perfect Indicator, showing whether Valve is open or closed.

Valves with Inside Screw have Non-Rising Stem and are especially suitable for use on pump columns in mines, etc.

THESE VALVES MAY BE PACKED WHILE UNDER PRESSURE

To do so, with Non-Rising Stem Valves, open the Valve wide by running the wedge tightly up to the top of the bonnet, which in turn draws the collar of the stem down tightly against the flange of the bonnet, forming a steam or water tight joint.

For the Outside Screw and Yoke Valves the stem is screwed out until the taper collar on the stem engages with the top of the bonnet and forms a tight joint.

Unless otherwise specified, Flanged Valves and other Companion Flanges will always be furnished with Male Face.

WORKING PRESSURES

These valves are suitable for the working pressures specified above when used in hydraulic installations in which shock is absent or so slight as to be negligible. When SUBJECT TO SHOCK they are NOT recommended for these pressures. See explanatory notes on page 175.

AIR OR GAS

Valves for Air or Gas are SPECIAL. See explanatory notes on page 175.

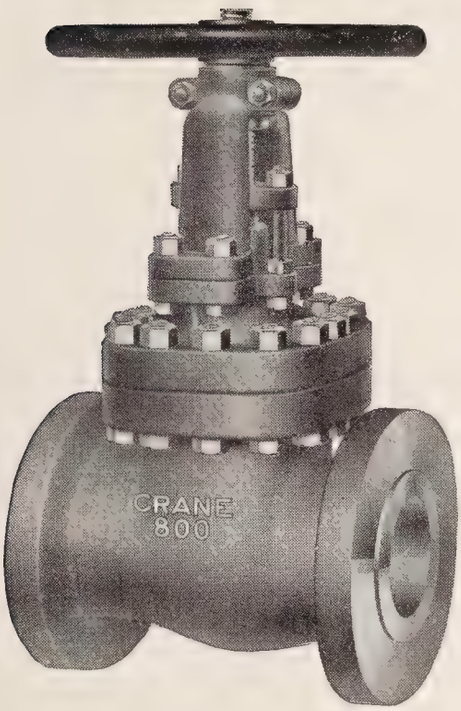
800-POUND AMERICAN HYDRAULIC STANDARD

FERROSTEEL GATE VALVES

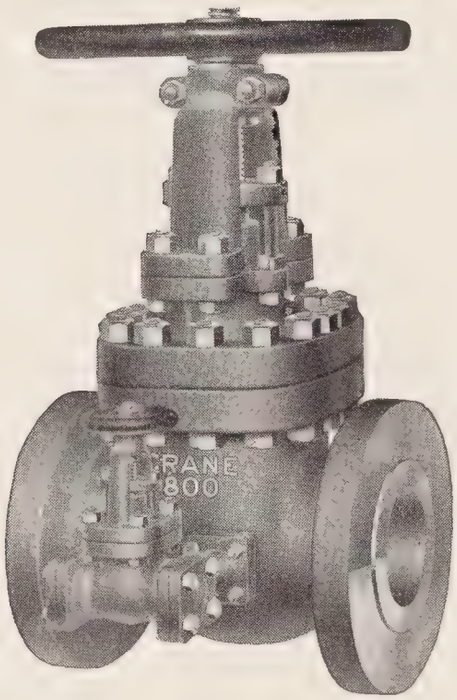
OUTSIDE SCREW AND YOKE **HARD METAL SEATS**

WITH AND WITHOUT BY-PASS
OPEN TO THE LEFT

TESTED TO PRESSURES AS FOLLOWS:
2000 POUNDS WHEN OPEN
800 POUNDS WHEN CLOSED AGAINST DISC



No. 805H
CODE: DARIVETTES



No 807H
CODE: DARMKAPSEL

Size.....Inches	1½	2	2½	3	3½	4	4½
Size.....Millimeters	38	50	64	76	90	100	113
No. 804 H, Screwed.....Each	30.00	40.00	60.00	81.00	98.00	113.00	135.00
No. 805 H, Flanged.....Each	33.00	40.00	68.00	90.00	105.00	120.00	150.00

Size.....Inches	5	6	7	8	10	12	
Size.....Millimeters	125	150	175	200	250	300	
No. 804 H, Screwed.....Each	150.00	195.00					
No. 805 H, Flanged.....Each	160.00	210.00	295.00	315.00	495.00	645.00	
No. 807 H, Flanged, with By-pass...Each		240.00	330.00	355.00	540.00	690.00	

WORKING PRESSURES

These Valves are suitable for 800 pounds pressure when used in hydraulic installations in which shock is absent or so slight as to be negligible.

WHEN SUBJECT TO SHOCK they are NOT recommended for these pressures. See explanatory notes on page 175.

AIR OR GAS

Valves for Air or Gas are SPECIAL. See explanatory notes on page 175.

It is desirable that all Valves 6 inch and larger have a By-Pass.

We do not recommend the use of screwed valves larger than 6 inch.

Unless otherwise specified, Flanged Valves will always be furnished with Male Face.

For general description see page 176.
For general dimensions see page 624.
For drilling templates see page 599.
For price list of drilling see page 486.

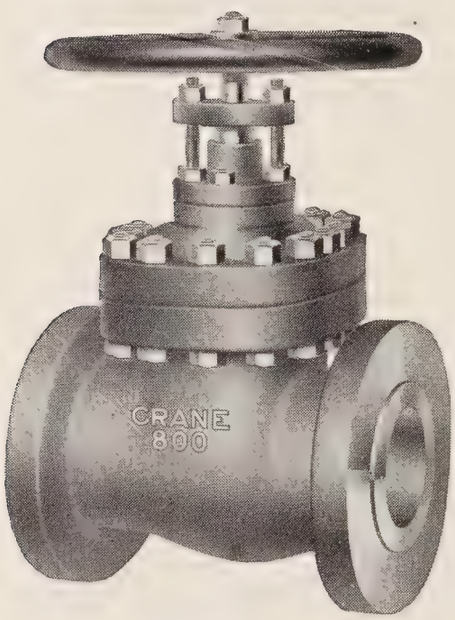
800-POUND AMERICAN HYDRAULIC STANDARD

FERROSTEEL WEDGE GATE VALVES

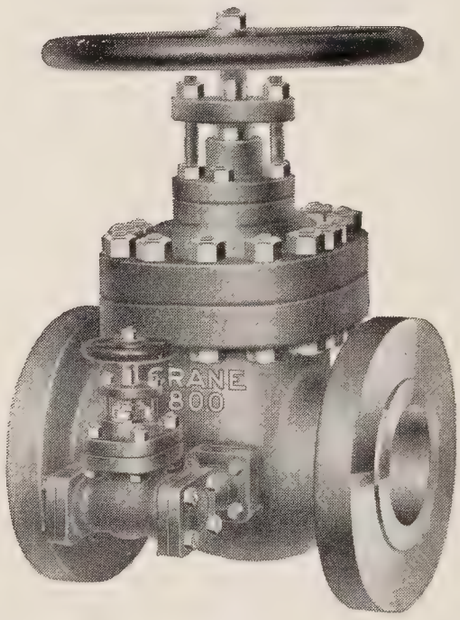
NON-RISING STEM
HARD METAL SEATS

WITH AND WITHOUT BY-PASS
OPEN TO THE LEFT

TESTED TO HYDROSTATIC PRESSURES AS FOLLOWS:
2000 POUNDS WHEN OPEN
800 POUNDS WHEN CLOSED AGAINST DISC



No. 801-H
CODE: DARTRAGEN



No. 803-H
CODE: DEAURABAM

Size.....Inches	1½	2	2½	3	3½	4	4½
Size.....Millimeters	38	50	64	76	90	100	113
No. 800 H, Screwed.....Each	27.00	34.00	51.00	72.00	85.00	98.00	120.00
No. 801 H, Flanged.....Each	30.00	39.00	60.00	80.00	95.00	105.00	135.00

Size.....Inches	5	6	7	8	10	12	
Size.....Millimeters	125	150	175	200	250	300	
No. 800 H, Screwed.....Each	135.00	175.00					
No. 801 H, Flanged.....Each	150.00	190.00	255.00	270.00	450.00	600.00	
No. 803, Flanged, with By-Pass. Each		210.00	295.00	315.00	495.00	645.00	

WORKING PRESSURE

These Valves are suitable for 800 pounds pressure when used in hydraulic installations in which shock is absent or so slight as to be negligible. WHEN SUBJECT TO SHOCK they are NOT recommended for these pressures. See explanatory notes on page 175.

AIR OR GAS

Valves for Air or Gas are SPECIAL. See explanatory notes on page 175.

It is desirable that all Valves 6 inch and larger have a By-Pass.

We recommend the use of Flanged Valves larger than 6 inch.

Unless otherwise specified, Flanged Valves are regularly furnished with Male Faces on flanges.

For general description see page 176.
For general dimensions see page 624.
For drilling Templates see page 599.
For price list of drilling see page 486.

CRANE SPECIALTIES

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A. S. M. E. BOILER CODE

In 1910, the American Society of Mechanical Engineers appointed a committee to consider Steam Boilers and Accessories with the view of eventually obtaining a boiler law suitable for uniform adoption. This was considered desirable because of the confusion existing due to various rules and regulations in force in the several states and cities.

In 1914 this committee formulated its first set of rules known as the A. S. M. E. Boiler Code, which has since been adopted by a number of states and municipalities in this country.

The Code includes specifications for materials used in the construction of boilers, the thickness of plates and tubes and their maximum allowable working pressures, the efficiency of joints, rivets and stays, the design of furnaces, tube sheets and combustion chambers, the construction of valves, fittings and appliances attached directly to the boiler, and the methods of setting, testing and inspecting boilers.

The Safety Valve requirements of these rules are of great importance owing to the fact that the Safety Valves must be large enough to discharge all the steam the boiler can generate, and still more important is the fact that these rules, in contrast to all previous boiler specifications, place a certain discharge rating on Safety Valves, in accordance with their lift, instead of allowing a certain size Safety Valve to be placed on a boiler regardless of its discharging capacity.

Crane Co. is in a position to fill practically all demands for BOILER SAFETY VALVES AND ALL OTHER PIPING MATERIAL that may be required under the Code.

Safety Valves for Receivers and Pipe Lines are not required to comply with the A. S. M. E. Boiler Code.

LOW PRESSURE

BRASS POP SAFETY VALVES

FOR STEAM COOKING KETTLES, TANKS, ETC.

CAN BE FURNISHED SET FOR ANY PRESSURE SPECIFIED BY THE CUSTOMER BETWEEN 5 AND 20 POUNDS

ALWAYS GIVE THE PRESSURE AT WHICH WE ARE TO SET THE VALVES TO BLOW OFF

No. 1160
CODE: DEBIBAMUS

These Valves are made of brass, and are fitted with best steel springs.

When not otherwise specified we will furnish No. 1160 rough body Valves set at 10 pounds.

No. 1164
CODE: DEBICARMOS

Size.....Inches	½	¾
Size.....Millimeters	13	19
No. 1160, Rough Body.....Each	5.25	5.25
No. 1164, Finished and Nickel Plated.....Each	6.75	6.75

The outlet holes on all sizes of these valves are located to blow "upward."

STANDARD BRASS POP SAFETY VALVES

SET AT ANY PRESSURE SPECIFIED FROM 5 TO 125 POUNDS

No. 1152
CODE: DEBILEMENT

Size.....Inches	½	¾	1
Size.....Millimeters	13	19	25
Price.....Each	8.00	8.00	10.00
Size.....Inches	1¼	1½	2
Size.....Millimeters	32	38	50
Price.....Each	12.00	15.00	23.00

WHEN ORDERING THIS STYLE VALVE ALWAYS SPECIFY NO. 1152, AND STATE THE PRESSURE VALVES ARE WANTED SET TO BLOW OFF.

These valves are made without the self-adjusting feature, and for ordinary purposes, where the uniform working pressure does not exceed 125 pounds.

FOR POP VALVES CONFORMING WITH THE REQUIREMENTS OF THE A. S. M. E. HEATING BOILER CODE, SEE PAGE 182.

LOW PRESSURE

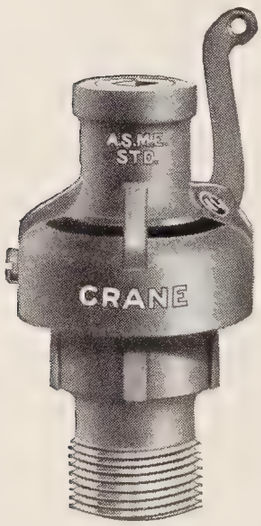
NON-ADJUSTABLE POP SAFETY VALVES

FOR STEAM HEATING BOILERS

THESE VALVES CONFORM TO THE REQUIREMENTS OF THE A. S. M. E. BOILER CODE

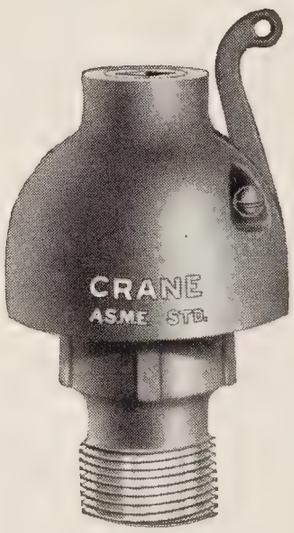
REGULARLY SET AT 15 POUNDS PRESSURE

MALLEABLE IRON BODY AND BASE — BRASS SEAT AND DISC



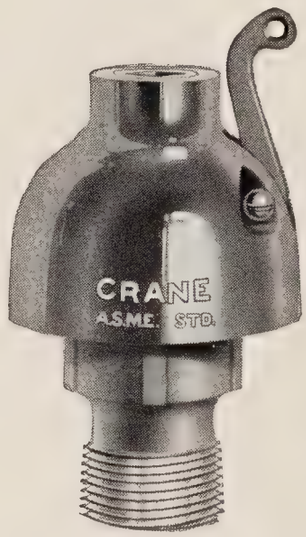
No. 1165
CODE: DEBLANCHI

***No. 1165V**
CODE: DEBLOQUENT



No. 1166
CODE: DEBUERAMUS

***No. 1166V**
CODE: DEBULLIATE



No. 1167
CODE: DEBUXASSEM

***No. 1167V**
CODE: DECAGONAL

PRICE LIST

Size.....Inches	1	1¼	1½	2	2½	3	3½	4
Size.....Millimeters	25	32	38	50	64	76	90	100
No. 1165 Rough Nickel Plated.....Each	6.00	6.75	8.25	11.25	26.00	37.50		
No. 1166 Black Enamel Each	5.75	6.75	8.25	10.00	16.00	22.00	53.00	63.00
No. 1167 Semi-finished Nickel Plated.....Each	7.00	8.00	9.75	12.00	18.75	25.00	58.00	71.00

*Nos. 1165-V, 1166-V and 1167-V are especially ground at the seat so as to be tight under vacuum as well as for steam pressure and are furnished at a special price.

These Valves are made of malleable iron with brass trimmings. Special attention has been paid to the bases, which are rigid and provide ample clearance for the tools, when Valves are installed in difficult places.

These Valves will be furnished locked up in such a way that the popping pressure can not be changed from the original set pressure.

These Valves can be furnished for any pressure specified from 3 lbs. to 25 lbs. when so ordered, at a special price.

The outlet openings on the No. 1165 Valves are located to blow upward, while the Nos. 1166 and 1167 Valves are arranged for downward discharge.

In localities where Boiler Inspector Seal is required and so specified we will furnish these Valves drilled in such a way that wire and seal can be attached.

If heavier and larger size Valves are wanted we will on order furnish our No. 1101, shown on page 187, to conform to the rules of the A. S. M. E. Code for Low Pressure Boilers for which a special price will be charged.

For High Pressure Safety Valves conforming with the A. S. M. E. Boiler Code, see page 185.

CRANE

IMPROVED POP SAFETY VALVES

The Patented Self-Adjusting Auxiliary Disc and Spring is a device which automatically regulates the blow-back of the valve within certain limits and is the direct reason for the following qualities:

HIGH DISCHARGING CAPACITY

SMALL BLOW DOWN OF PRESSURE

MINIMUM WASTE OF STEAM

ABSENCE OF WIRE DRAWING AT THE SEAT

PROMPT SEATING WITHOUT HAMMERING

The huddling or pop chamber of a Crane Pop Safety Valve is so constructed that it is practically steam tight when the Valve is closed. As a result, the slightest relief of steam past the seat immediately lifts the disc and thereby reduces the wire-drawing effect of the steam to a minimum.

To compensate for the restriction past the lip on the main disc, which ordinarily would result in a blow-back greater than is considered economical, the auxiliary device is provided with ports which relieve the pop chamber and furnish automatic control of this condition.

When the velocity of the escaping steam is no longer sufficient to sustain the disc against the tension of the spring, the Valve closes with a snap which insures tight seating. The auxiliary device which closes slightly in advance of the main disc permits a steam cushion to form which allows the main disc to close tightly, but without destructive hammering.

The high lift and small blow-back of Crane Pop Safety Valves afford quick relief, with the smallest possible loss of steam.

EACH VALVE IS CORRECTLY SET AND THOROUGHLY TESTED BEFORE SHIPMENT.

TO CLEAN OR GRIND THE SEAT, remove Lock, Cap and Lever; loosen lock-nut and take all tension off the spring by turning the adjusting screw upward, then unbolt the bonnet from body of Valve, and all parts are accessible.

The Valves may then be ground in the same manner as an ordinary Valve.

When installing Valves, great care should be used in making joints with red lead, as it is likely to lodge on the Valve Seat and prevent tight closing. This, as well as pipe scale and other foreign matter, is frequently found to be the cause of leaky Valves.

POP VALVES SHOULD BE INSTALLED WITH THE STEM IN A VERTICAL POSITION.

For additional information regarding Pop Valves of the outside spring and yoke type, see Page 188.

CRANE

BRASS POP SAFETY VALVES

FOR STATIONARY BOILERS, RECEIVERS, PIPE LINES, ETC.

VALVES FOR GENERAL PURPOSES

Nos. 1144, 1146, 1148, 1150 and 1158 Steam Pop Valves are recommended for use on Stationary and Portable Boilers, Steam Receivers and Pipe Lines, for pressures up to 250 pounds.

VALVES FOR A. S. M. E. BOILER CODE

Nos. 1144, 1146, 1148 and 1150 can be furnished to comply with the A. S. M. E. Boiler Code, ½ inch size up to 250 pounds; ¾, 1, 1¼, 1½ and 2 inches for pressures up to 150 pounds when so ordered, at a special price.

Brass Pop Valves for higher pressures can be furnished to conform to the requirements of the Code. Prices on application.

VALVES FOR COMPRESSED AIR AND GAS

Nos. A-1144 and A-1148, ground special to insure tight seating, can be furnished for pressures up to 250 pounds. For higher pressures special valves will be furnished.

REGRINDING AND RESETTING

To clean or grind the seat, remove the cap, lock-nut and casing and grind in the same manner as an ordinary valve. To reset valves, loosen the locknut and screw the cap plug UP TO DECREASE PRESSURE and DOWN TO INCREASE PRESSURE; then tighten lock-nut.

For general information see page 183.

BRASS POP SAFETY VALVES

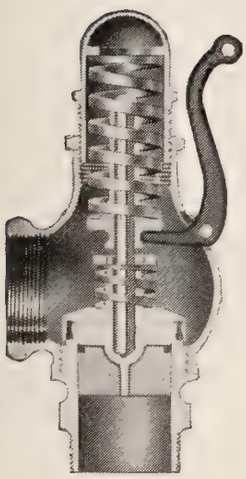
FOR SATURATED STEAM

(CRANE PATENT)

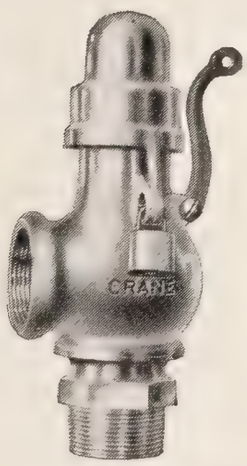
FOR STATIONARY BOILERS, RECEIVERS, PIPE LINES, ETC.

CAN BE FURNISHED SET FOR ANY PRESSURE SPECIFIED BY THE CUSTOMER BETWEEN 5 POUNDS AND 250 POUNDS

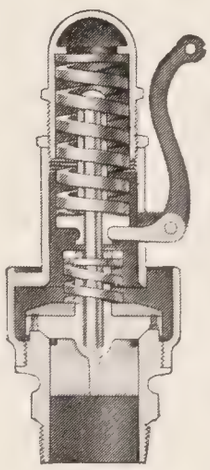
ALWAYS GIVE THE PRESSURE AT WHICH WE ARE TO SET THE VALVES TO BLOW OFF



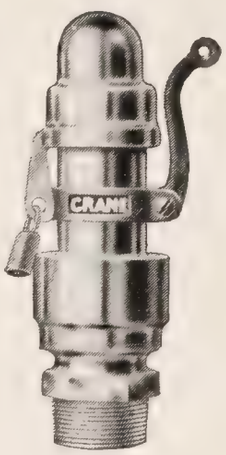
NO. 1144
CODE:
DECALEPIS



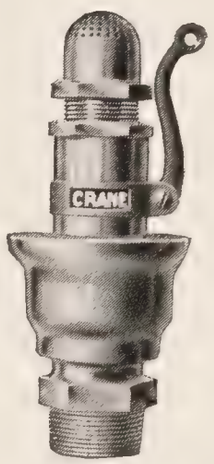
NO. 1146
CODE:
DECALQUERA



NO. 1148
CODE:
DECAMETRO



NO. 1150
CODE:
DECKLEHM



NO. 1158
CODE:
DECLAMANTI

Size.....Inches	½	¾	1	1¼	1½	2	2½
Size.....Millimeters	13	19	25	32	38	50	64
No. 1144, Side Outlet....Each	$11.00	$11.00	$13.00	$16.00	$19.00	$29.00	$46.00
No. 1146, Lock Up.....Each	12.00	12.00	14.00	17.00	21.00	31.00	49.00
No. 1148, Top Outlet....Each	8.00	8.00	10.00	12.00	15.00	23.00	38.00
No. 1150, Lock Up.....Each	9.00	9.00	11.00	13.00	17.00	25.00	40.00
No. 1158, Muffler.....Each			21.00	26.00	32.00	48.00	
No. 1158, Lock Up.....Each			26.00	32.00	39.00	55.00	

WHEN ORDERING, ALWAYS SPECIFY CATALOGUE NUMBER OF VALVES.

Nos. 1146, 1150 and 1158 Lockup are furnished with lock-up attachment but no lock. Locks will be furnished when ordered at an extra price.

In localities where Boiler Inspector Seal is required and order so specifies, we will furnish the lock-up Valves with suitable holes drilled for attaching wire and seal.

BRASS POP SAFETY VALVES

TO CONFORM TO THE A. S. M. E. BOILER CODE

FOR STEAM WORKING PRESSURES UP TO 150 POUNDS

Size .....Inches	½	¾	1	1¼	1½	2
Size .....Millimeters	13	19	25	32	38	50
No. 1144, Side Outlet. A. S. M. E...	13.50	13.50	16.00	19.50	23.25	36.00
No. 1148, Top Outlet. A. S. M. E.....	9.75	9.75	12.25	14.75	18.50	28.50

Valves required for higher pressures than covered above, will be made to the following maximum working pressures. ¾-inch and 1-inch sizes up to 250 pounds. 1¼ and 1½-inch up to 200 pounds. These will be made to order only at a special price.

BRASS POP SAFETY VALVES FOR AIR AND GAS

FOR RECEIVERS, PIPE LINES, ETC., FOR SPECIFIED PRESSURES FROM 5 TO 250 POUNDS

No. A-1144

CODE: DECOMMIMES

No. A-1148

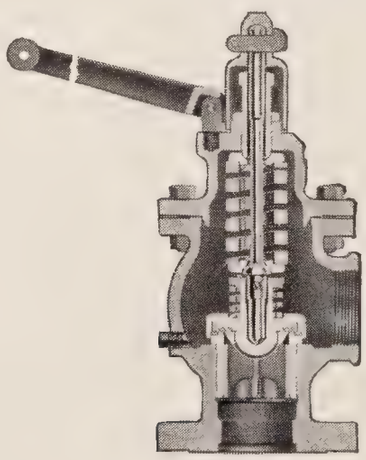
CODE: DECORAVATE

Size.....Inches	½	¾	1	1¼	1½	2	2½
Size.....Millimeters	13	19	25	32	38	50	64
No. A-1144.....Each	14.00	14.00	16.50	19.50	23.50	34.00	53.00
No. A-1148.....Each	10.75	10.75	13.00	15.00	19.00	27.50	44.50

Brass Pop Valves when ordered for service on compressed air or gas have special ground seats.

IRON BODY POP SAFETY VALVES FOR AIR AND GAS

FOR RECEIVERS, PIPE LINES, ETC., FOR SPECIFIED PRESSURES FROM 5 TO 150 POUNDS



No. 1102

CODE: DECOUDRAIT

Size.....Inches	2½	3	3½	4	4½	5
Size.....Millimeters	64	76	90	100	113	125
No. 1102 Crane Renewable Disc, Brass Seat. Each	65.00	75.00	100.00	110.00	145.00	175.00

The No. 1102 Iron Body Valves are fitted with Crane Renewable Discs.

These Valves have large relieving capacities and are recommended for air pressures up to 150 pounds.

For pressures above 150 pounds, No. 1116 Valves specially ground for air are recommended.

WHEN ORDERING, BE SURE TO STATE PRESSURE AT WHICH VALVES ARE WANTED SET TO BLOW OFF. THESE VALVES SHOULD BE ORDERED FOR PRESSURES 10% ABOVE THE NORMAL OPERATING PRESSURE OF THE INSTALLATION.

IRON BODY POP SAFETY VALVES

(CRANE PATENT)

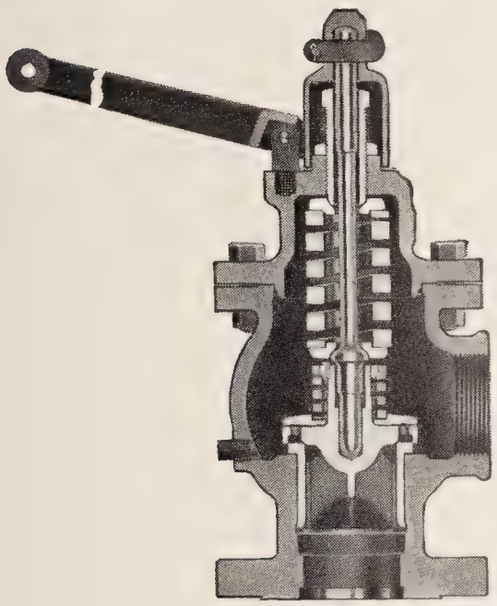
FOR SATURATED STEAM

FOR STATIONARY BOILERS, RECEIVERS, PIPE LINES, ETC.

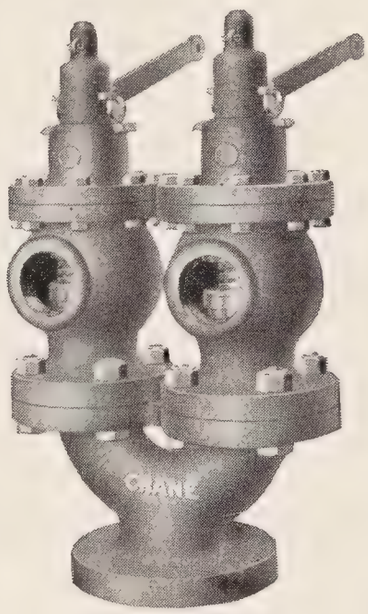
CAN BE FURNISHED SET FOR ANY PRESSURE SPECIFIED BY THE CUSTOMER BETWEEN 5 POUNDS AND 150 POUNDS

ALWAYS GIVE THE PRESSURE AT WHICH WE ARE TO SET THE VALVES TO BLOW OFF

IRON BODY BRASS OR MONEL METAL SEATS



No. 1101
SINGLE VALVE
CODE: DECOUVERTE



No. 1103
TWIN VALVES
CODE: DEFATIGABO

Size.....Inches	2½	3	3½	4	4½	5
Size.....Millimeters	64	76	90	100	113	125
No. 1101 Brass Seat.....Each	42.00	50.00	68.00	75.00	100.00	120.00
No. 1101 Monel Seat.....Each	48.00	57.00	75.00	87.00	115.00	135.00
No. 1103 Brass Seat.....Each	118.00	142.00	186.00	210.00	290.00	350.00
No. 1103 Monel Seat.....Each	130.00	156.00	200.00	234.00	320.00	380.00

When ordering, always specify the Figure number of Valve.

No. 1101 Valves are made with flanged inlet and screwed outlet. Hexagon screwed base furnished, when so ordered, at same price.

No. 1103 prices include two Valves and corresponding Y base all bolted together as shown in cut.

In localities where Boiler Inspector Seal is required, and order so states, we drill an extra hole in the Stem Key at top of Valve, for attaching the wire and seal. This at no extra charge.

Valves furnished locked up, including lock, at an extra price.

These Valves can be made to comply with the A. S. M. E. Boiler Code for low pressure steam heating boilers when so ordered.

For High Pressure Safety Valves for the A. S. M. E. Code, see pages 189 and 190.

For dimensions, see page 632.

Templates for drilling, page 598. Price List for drilling, page 484.

OUTSIDE SPRING AND YOKE POP SAFETY VALVES

(CRANE PATENT)

These Valves are designed to meet the exacting requirements of modern practice in the use of high pressure steam and have embodied in their construction all the Crane features that have proved so satisfactory in the past; notably the Patented Auxiliary Disc and Spring. They act quickly to prevent wiredrawing, but with out shock even under the high pressures so common to-day.

The main springs in the valves are not subjected to the deteriorating effect of high temperatures since they are placed practically outside the body.

In addition to the auxiliary disc and spring device, fully explained on page 183, particular attention is called to the

BLOW-BACK REGULATOR

This provides a means for adjusting the blow-back when changing or regulating the set pressure and permits the user of these pop valves to regulate at will the amount of steam wasted by turning our patented combination encasing sleeve and blow-back regulator. The threads on which this device operates are placed so that they are not affected by the extreme temperatures of the steam, and it is accessible at all times which is not true of devices for similiar purposes in other makes of pop safety valves.

TO CHANGE OR ADJUST PRESSURES

Proceed as directed on page 184. Should the valve waste too much steam between opening and closing, turn the regulator in the direction indicated by the arrow on upper edge of sleeve until the desired blow-back is obtained. Should the valve work too close to be practical or simmer too long before popping, turn sleeve in opposite direction.

FULL INSTRUCTION CARD FURNISHED WITH EACH VALVE

The regulation of the blow-back described above can be accomplished without taking the valve apart and with the pressure on.

OUTSIDE SPRING AND YOKE POP SAFETY VALVES

(CRANE PATENT)

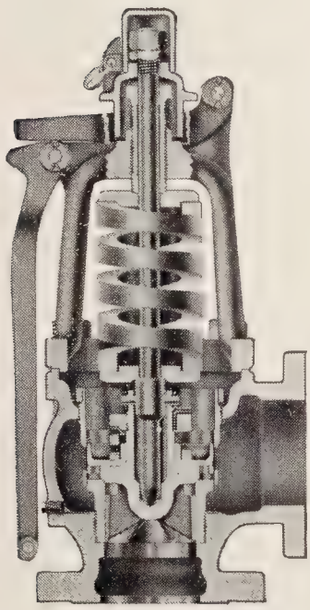
FOR SATURATED STEAM

WILL FULFILL ALL SAFETY VALVE REQUIREMENTS OF BOILER RULES COVERING STATIONARY BOILERS

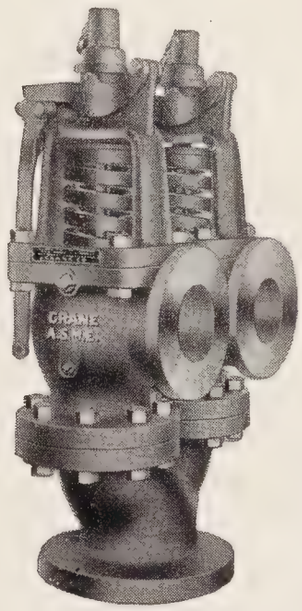
FERROSTEEL BODY **BRASS OR MONEL METAL SEAT**

CAN BE FURNISHED SET FOR ANY PRESSURE SPECIFIED BY THE CUSTOMER BETWEEN 5 POUNDS AND 250 POUNDS

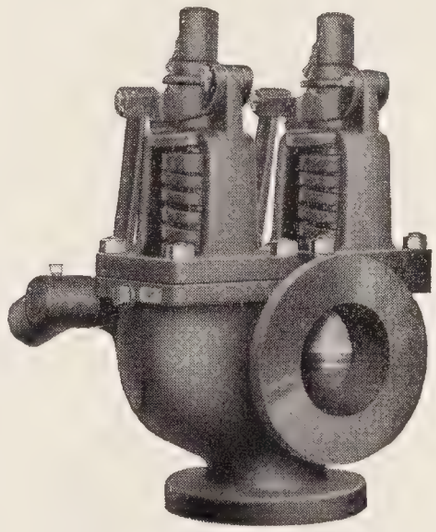
ALWAYS GIVE THE PRESSURE AT WHICH WE ARE TO SET THE VALVES TO BLOW OFF



SINGLE VALVES
No. 1117, FLANGED OUTLET
CODE: DEFONCAMES
No. 1116, SCREWED OUTLET
CODE: DEFENSASTE



TWIN VALVES
No. 1121, FLANGED OUTLET
CODE: DEHIBUERO
No. 1120, SCREWED OUTLET
CODE: DEGONDAIT



DUPLEX VALVES
No. 1119, FLANGED OUTLET
CODE: DEJETANTE

Size.....Inches	1½*	2	2½	3	3½	4	4½
Size.....Millimeters	38	50	64	76	90	100	113
Nos. 1116 and 1117, Brass Seat.....Each	75.00	100.00	120.00	135.00	160.00	170.00	225.00
Nos. 1116 and 1117, Monel Metal Seat.....Each	81.00	106.00	126.00	142.00	167.00	182.00	240.00
Nos. 1120 and 1121, Twin Valves, Brass Seats.....Each	171.00	230.00	276.00	312.00	370.00	400.00	540.00
Nos. 1120 and 1121 Twin Vales, Monel Metal Seats Each	183.00	242.00	288.00	326.00	384.00	424.00	570.00
No. 1119 Duplex, Brass Seat.....Each			Prices on application.				
No. 1119 Duplex, Monel Metal Seats.....Each			Prices on application.				

*The 1½-inch size is furnished screwed outlet only and with square flange on inlet,

WHEN ORDERING, ALWAYS SPECIFY THE NUMBER OF VALVE AND WHETHER BRASS OR MONEL SEATS.

VALVES WITH BRASS SEATS WILL ALWAYS BE FURNISHED UNLESS MONEL METAL SEAT IS SPECIFIED. THESE VALVES ARE FURNISHED LOCKED UP, INCLUDING LOCKS.

When so desired, guard covers for the spring can be furnished. An extra charge will be made for these guards. See page 191.

No. 1116 and 1117 SINGLE VALVES ARE REGULARLY FURNISHED WITH FLANGED INLETS; HEXAGON SCREWED BASES FURNISHED WHEN SO ORDERED.

No. 1120 and 1121 Twin Valves consist of two single Valves mounted on a Y base all bolted together as shown in cut.

No. 1119 Duplex Valve consists of two valves in one body having one common lifting gear and a common inlet and outlet, saving piping and head room.

For description of Cast Steel Valves, see page 190.

For general dimensions, see page 633.

Templates for drilling page 598.

Price list for drilling, page 484.

CAST STEEL

OUTSIDE SPRING AND YOKE POP SAFETY VALVES

(CRANE PATENT)

WILL FULFILL ALL SAFETY VALVE REQUIREMENTS OF STATIONARY BOILER RULES

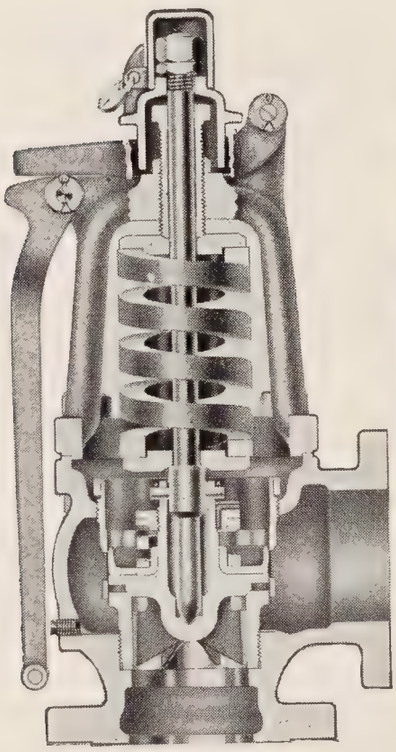
CAST STEEL BODY AND YOKE **MONEL METAL SEAT**

SET TO ANY PRESSURE FROM 5 TO 350 POUNDS

WILL WITHSTAND ANY TEMPERATURE UP TO 800 DEGREES FAHRENHEIT

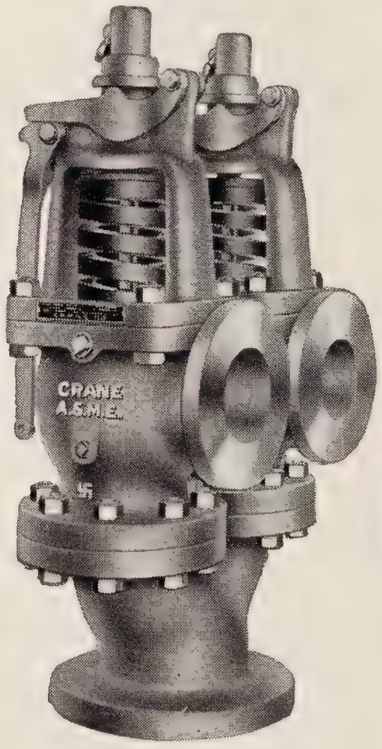
Steel Bolts of High Tensile Strength or commercial bolts larger in diameter must be used on the end flanges when valves are subjected to steam working pressures in excess of 300 pounds.

A. S. M. E. Extra Heavy Bolting using commercial bolts is not strong enough for steam working pressures in excess of 300 pounds.



No. 1116A
SCREWED OUTLET
CODE: DELAJABA

No. 1117A
FLANGED OUTLET
CODE: DELASSAVI



TWIN VALVES

No. 1120A
SCREWED OUTLET
CODE: DELEGATIUS

No. 1121A
FLANGED OUTLET
CODE: DELICATINO

DUPLEX VALVE

No. 1119A
FLANGED OUTLET
CODE: DELUSTRAVI

SINGLE AND TWIN VALVES IN SIZES 1½ TO 4½ INCH INC.*
DUPLEX VALVES IN SIZES 2½ TO 4½ INCH INCLUSIVE

PRICES ON APPLICATION

When ordering always specify the number of Valve, and state the pressure at which the Valves are to pop-off.

Nos. 1116-A and 1117-A, Single Valves are regularly furnished with flanged inlets, hexagon screwed bases furnished when so ordered.

Nos. 1120-A and 1121-A, Twin Valves consist of two single valves mounted on a Y base, all bolted together as shown in illustration.

No. 1119-A Duplex Valve consists of two valves in one body having one common lifting gear and a common inlet and outlet, saving piping and headroom.

*The 1½-inch size is furnished screwed outlet only and with square flange on inlet.

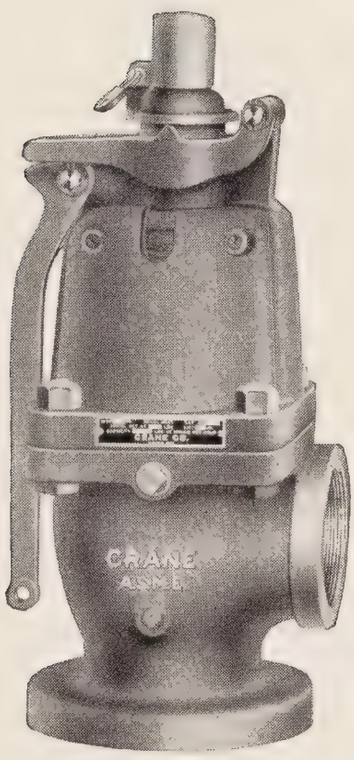
For general dimensions, see page 633.
Templates for drilling, page 598.

GUARD COVERS FOR PROTECTION OF SPRINGS ON

OUTSIDE SPRING AND YOKE

POP SAFETY VALVES

(CRANE PATENT)



No. 1116 WITH COVERS ATTACHED

GUARD COVERS ONLY

CODE: DEMANDERAS

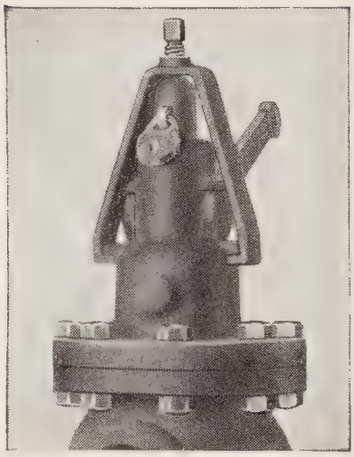
Size of Valve.....Inches	1½	2	2½	3	3½	4	4½
Size of Valve.....Millimeters	38	50	64	76	90	100	113
Price of Covers only.....Per set	2.00	3.50	5.00	6.50	8.25	10.25	12.00

We have designed Covers that can be easily attached to our valves without any drilling of holes, thereby transforming them into Valves of the Encased Spring Type.

These Covers should only be used where the temperature of the steam is lower than 400 deg. Fahr., as higher temperatures are likely to interfere with the temper of the Valve Springs.

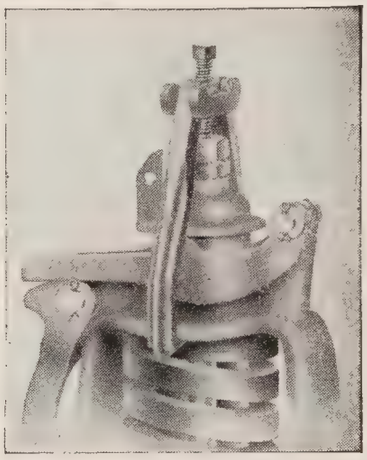
INSPECTOR TEST YOKES

FOR IRON BODY POP SAFETY VALVES



FOR IRON BODY VALVE WITH INSIDE SPRING

CODE: DEMIGANDO



FOR IRON BODY VALVE WITH OUTSIDE SPRING

CODE: DENODABAS

These Yokes are easily attached and do not interfere with the tension on the spring or the original set pressure, consequently, the spring is not injured by undue strain or excessive pressure, and the Valve is ready to resume service without re-adjustment.

Turn the screw down lightly on top of stem, **using only enough pressure to prevent the Valve from lifting,** and it will firmly and tightly hold the Valve to its seat against the required water pressure applied by the Inspector when testing the boiler.

Be sure to remove the Yoke after the test is completed.

Size.....Inches	1½	2	2½	3	3½	4	4½	5
Size.....Millimeters	38	50	64	76	90	100	113	125
Price for Inside Spring Valves....Each			4.30	4.30	4.50	5.00	7.25	7.25
Price for Outside Spring Valves...Each	3.00	3.50	4.25	5.00	5.75	6.50	7.25	

LOCOMOTIVE POP SAFETY VALVES

OPEN POP AND MUFFLER TYPES

These valves are made of high grade steam metal with housings of malleable iron and are well finished in every respect. They are accurate and positive in operation and are very sensitive to excessive pressures and permit of fine adjustments.

Attention is called to the blow-back regulator which provides means for a wide range in adjustment when changing or regulating the set pressure.

This is accomplished by lowering and raising the regulating ring when an increase or decrease in the blow-back of the valve is desired, and maintaining the constant feature of a minimum loss of steam between the opening and the closing points. This regulation of the blow-back can take place while the boiler is under pressure.

The open type valves discharge the steam into the atmosphere in the most direct manner and are, on account of their large discharging capacity, necessarily somewhat noisy, therefore we recommend the installation of one Muffler Valve on Locomotives whether such valves are required by ordinance or not.

By having one muffler valve set lower than the rest of the valves on the Locomotive it can take care of the boiler except under extreme conditions when the open valves will be amply large enough to take care of the steam generated by the boiler, provided the size of the Safety Valves are calculated in accordance with the accepted formulae recommended by the American Master Mechanics Association.

FULL INSTRUCTION CARD FURNISHED WITH EACH VALVE.

FOR ILLUSTRATIONS AND INSTRUCTIONS WHEN ORDERING, SEE PAGE 194.

LOCOMOTIVE POP SAFETY VALVES

OPEN AND MUFFLER TYPES

MALLEABLE IRON BODIES — BRASS BASES AND TRIMMINGS

SET TO ANY PRESSURE UP TO 250 POUNDS

MUFFLER VALVE

No. 1180 FEMALE BASE
CODE: DENOTENTUR

No. 1181 MALE BASE
CODE: DENTADURA

OPEN VALVE

No. 1183 MALE BASE
CODE: DENTAVANO

No. 1182 FEMALE BASE
CODE: DENTAPARGA

Size Valve—Seat Opening		Inches	2½	3
Diameter of Body—Open and Muffler		Inches	5¾	6⅝
Overall Height	Female	Inches	12	13½
	Male	Inches	13	14
Size of Base Connection, Iron Pipe Threads	Female	Inches	2	2½
		Millimeters	50	64
	Male	Inches	2½	3
		Millimeters	64	76
Size of Bore in Male Base		Inches	2	2½
Price, Nos. 1180 or 1181		Each	80.00	90.00
Price, Nos. 1182 or 1183		Each	65.00	75.00

VALVES FURNISHED LOCKED UP WHEN SO SPECIFIED

On orders that do not otherwise specify, Valves will be furnished with female base having regular iron pipe size thread and corresponding to one size smaller pipe, as given in above table. For instance, when 3 inch Valves are ordered, female base will be furnished, with 2½ inch regular iron pipe thread.

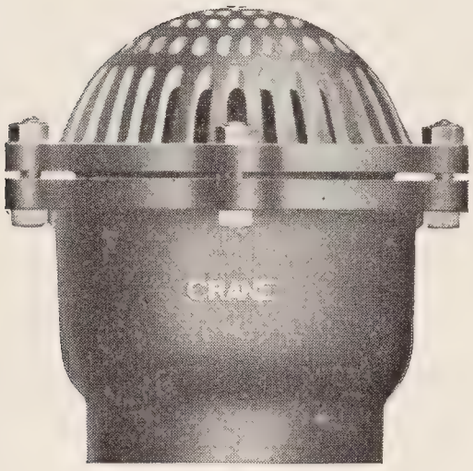
On special orders, the bases of Valves will be made either male or female, as required, and to suit any special thread called for in specifications. Special Bushings to screw or press into dome will also be furnished to order according to drawings and specifications submitted.

When ordering, always specify the number and the pressure at which Valves are to be set to blow off.

MUFFLER ATTACHMENT

FOR POP SAFETY VALVES

CAST IRON



CODE: DENTEBRURA

Size, inlet.....Inches	2	2½	3	3½	4	4½	5
Size, inlet.....Millimeters	50	64	76	90	100	113	125
Price, Screwed.....Each	10.00	12.00	14.00	16.00	19.00	25.00	30.00
Price, Flanged.....Each	13.00	15.00	17.00	20.00	23.00	30.00	38.00
Diameter Flange.....Inches	6	7	7½	8½	9	9¼	10

These Muffler Attachments are adapted for use in connection with Stationary Pop Safety Valves.

They may be attached either directly to the outlet of the Valve or at the end of the discharge pipe, as may be most convenient.

They will effectively subdue the objectionable noise of escaping steam as far as it is possible to do so, without interfering with the operation of Valve, or retarding the free escape of steam.

The several perforated plates provided in the construction of this Muffler Attachment, give a total area of perforations, considerably in excess of the area required to afford free outlet to the steam.

These Attachments are not necessarily confined to use in connection with Pop Safety Valves. They may be applied to the end of any pipe to subdue the noise of discharging steam.

Templates for drilling, page 596. Price List for drilling, page 483.

FERROSTEEL Y BASES

FOR SATURATED STEAM WORKING PRESSURES UP TO 250 POUNDS

FOR TWIN POP SAFETY VALVES

CODE: DEPALANDAM

PRICE LIST

Size.....Inches	1½	2	2½	3	3½	4	4½	5
Size.....Millimeters	38	50	64	76	90	100	113	125
Faced.....Each	14.00	21.50	26.00	32.00	38.00	45.00	68.00	83.00
Faced & Drilled..Each	16.25	24.00	29.00	35.00	42.00	50.00	75.00	95.00

DIMENSIONS

Size Outlet.....Inches	1½	2	2½	3	3½	4	4½	5
Size Outlet.Millimeters	38	50	64	76	90	100	113	125
Dia.Top Flange.Inches	*4 11/16	6½	7½	8¼	9	10	10½	11
Size Inlet.....Inches	2½	3½	4	4½	5	6	7	7
Size Inlet..Millimeters	64	90	100	113	125	150	175	175
Dia.Inlet Flange Inches	7½	9	10	10½	11	12½	14	14
Largest O. D....Inches	9 11/16	13 5/8	15 1/8	16 5/8	18 1/8	20 1/8	21 5/8	22¼
Face to Face...Inches	5¼	7	7¾	8½	9	9¾	10¼	11

*Rectangular Flange.

These Y Bases can be furnished in cast steel at a special price.

Bases with Three outlet openings will be made to order, prices on application.

SCREWED BRASS RELIEF VALVES

FOR AIR, STEAM, OIL AND WATER

Relief valves are used for receivers and pipe lines where the pressure drop is only of small consequence. For air, oil and water these valves should be ordered for a pressure 20% higher than that carried in the system.

For installations on air and steam where only small fluctuations in the pressure are tolerated, use pop safety valves. See pages 184 to 186.

No. 1132 Relief Valves are intended for compressors and steam cylinders and also for receivers and steam lines.

Nos. 1125, 1126, 1134, 1135 and 1138 Relief Valves are recommended for service on steam and water lines and for receivers and cylinders, where popping action relief is wanted from excessive pressures.

Nos. 1126 and 1135 Valves are furnished with handwheels for quick adjustment. Nos. 1125, 1132 and 1134 are furnished for wrench adjustment, with screwed caps for protection of the adjusting screw.

No. 1138 Valves are fitted with lockup attachment, but no locks. Locks are furnished when so ordered at an extra price. When inspector's seal is required, suitable holes are drilled for attaching wire and seal.

To adjust for different pressures, loosen locknut, turn handwheel or adjusting screw to the right to increase pressure and to the left to decrease pressure; then tighten locknut.

All relief valves can be adjusted for a pressure 20% higher or lower than the pressure for which the valve is purchased, but not in excess of the maximum set pressure as given.

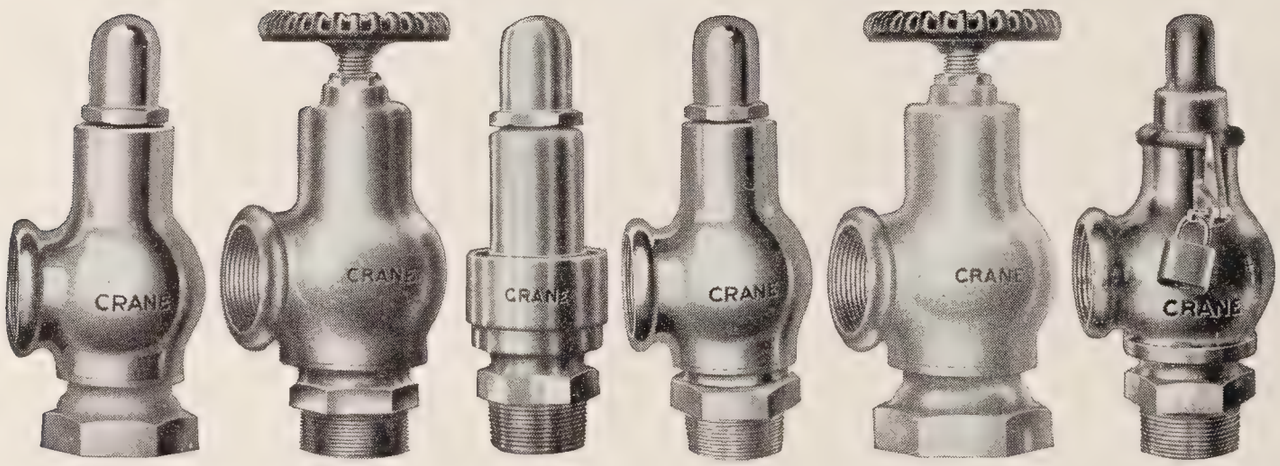
SCREWED BRASS RELIEF VALVES

FOR

AIR, STEAM, GAS, OIL AND WATER

FOR USE ON

CYLINDERS, PIPE LINES, PRESSES, PUMPS, RECEIVERS, TANKS, ETC.



No. 1125	No. 1126	No. 1132	No. 1134	No. 1135	No. 1138
CODE: DEPARLERA	CODE: DEPERDARIS	CODE: DEPERSUADA	CODE: DEPETRANTE	CODE: DEPIAUTER	CODE: DEPLEAMUS

Size.....Inches	½	¾	1	1¼	1½	2	2½	3	3½	4
Size. Millimeters	13	19	25	32	38	50	64	76	90	100
No. 1125, Finished. . Each	11.00	11.00	13.00	16.00	19.00	29.00	46.00	77.00	105.00	135.00
No. 1126, Finished. . Each	11.00	11.00	13.00	16.00	19.00	29.00	46.00			
No. 1132, Finished. . Each	9.00	9.00	11.00	13.00	16.00	24.00	40.00			
No. 1134, Finished. . Each	11.00	11.00	13.00	16.00	19.00	29.00	46.00			
No. 1135, Finished. . Each	11.00	11.00	13.00	16.00	19.00	29.00	46.00	77.00	105.00	135.00
No. 1138, Finished. . Each	12.00	12.00	14.00	17.00	21.00	31.00	49.00			

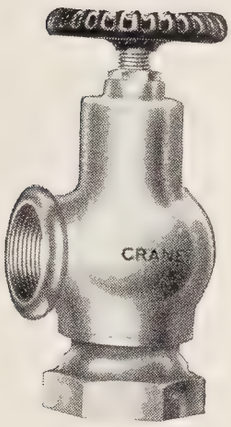
When ordering, always specify the number and state the pressure at which Valves are wanted set to relieve.

For service on steam, sizes ½-inch to 2½-inch will be furnished for any pressure specified between 5 pounds and 250 pounds and sizes 3, 3½ and 4-inch will be furnished for 200 pounds only.

For air, gas, oil or water of normal temperatures the ½ to 2½-inch sizes can be furnished for 300 pounds maximum set pressure, 250 pounds working pressure, and the 3, 3½ and 4-inch sizes for 250 pounds maximum set pressure, 200 pounds working pressure.

BRASS HYDRAULIC RELIEF VALVES

FOR WATER AND OIL SERVICE



No. 1128

CODE: DEPLEVISTI

No. 1130

CODE: DEPLORARLE

Size.....Inches	½	¾	1	1¼	1½	2	2½
Size.....Millimeters	13	19	25	32	38	50	64
No. 1128 Finished.....Each	25.00	25.00	30.00	35.00	40.00	55.00	100.00
No. 1130 Semi-Finished.....Each	45.00	45.00	50.00	85.00	90.00	130.00	225.00

WHEN ORDERING, ALWAYS SPECIFY THE NUMBER AND STATE THE PRESSURE AT WHICH VALVES ARE WANTED SET TO RELIEVE.

No. 1128 Valves will be set at any pressure specified up to 600 pounds, the maximum working pressure not to exceed 500 pounds. This style of Valve is furnished with a Female Base and is especially adapted for high pressure service, such as Boiler Feed Lines, etc.

No. 1130 Valves will be furnished for any specified pressure up to the following:

½ inch Valve—3600 pounds working pressure; 4500 pounds maximum set pressure
¾ inch Valve—3600 pounds working pressure; 4500 pounds maximum set pressure
1 inch Valve—2000 pounds working pressure; 2500 pounds maximum set pressure
1¼ inch Valve—2000 pounds working pressure; 2500 pounds maximum set pressure
1½ inch Valve—1500 pounds working pressure; 1800 pounds maximum set pressure
2 inch Valve—1300 pounds working pressure; 1600 pounds maximum set pressure
2½ inch Valve—1300 pounds working pressure; 1600 pounds maximum set pressure

If wanted for pressures higher than these, special Valves will be made to order Prices on application.

These Valves are made of a special metal, with long and durable springs of best quality steel. They will be furnished with hexagon female bases, as shown in illustration above, unless otherwise specified.

Hydraulic Relief Valves should be ordered set 20% higher than the maximum operating pressure of the installation. This will insure against wastage of water caused by the Valves relieving when not necessary to safeguard the system.

They have found extensive use for all purposes where prompt and efficient relief is required in connection with extremely high pressure service, such as Hydraulic Presses, High Pressure Pumping Systems, Hydraulic Elevators, Pipe Lines, etc.

These Valves can not be used as Shock Relief Valves.

To adjust for different pressures, loosen lock-nut, turn hand-wheel or pressure screw to the Right to increase pressure; to the Left to decrease pressure, then tighten lock-nut.

Hydraulic Relief Valves can be readjusted for pressures 20% higher or lower than the pressure for which the valve is purchased, but not in excess of maximum set pressure given above.

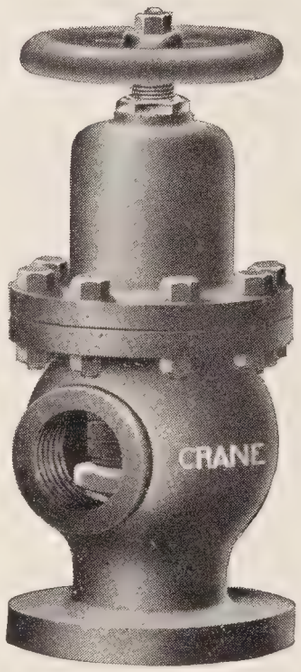
Note—On very high pressures the use of several small relief Valves is preferable to using one large Valve only.

WATER RELIEF VALVES

IRON BODY — BRASS SEAT AND DISC

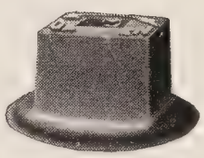
Two classes of Valves for Water and Oil Pumps, Stand Pipes, Pipe Lines, Cylinders, Oil Lines, etc.

The No. 1123 Valves will be set at any pressure specified from 10 to 300 pounds, and the No. 1124 Valves at any pressure specified from 301 to 600 pounds.



No. 1123
CODE: DEPLUITOTE

No. 1124
CODE: DEPOSITOME



When wanted for wrench adjustment the square stem nut, as shown above, will be used in place of hand-wheel on this style Valves.

Letters and arrow are cast on wrench nut as shown

No. 1123 FOR 250 POUNDS WORKING PRESSURE, 300 POUNDS MAXIMUM SET PRESSURE. CAST IRON BODY AND BONNET, BRASS SEAT AND DISC.

No. 1124 FOR 500 POUNDS WORKING PRESSURE, 600 POUNDS MAXIMUM SET PRESSURE. FERROSTEEL BODY AND BONNET. HARD METAL SEAT AND DISC.

Size	Inches	2½	3	3½	4	4½	5
Size	Millimeters	64	76	90	100	113	125
Price No. 1123	Each	42.00	50.00	68.00	75.00	100.00	120.00
Price No. 1124	Each	Prices on application.					

Hydraulic Relief Valves should be set 20 per cent higher than the normal working pressure of the installation. This will insure against waste of water caused by Valves relieving when not necessary to safeguard the system.

To change set pressures: Turn wheel to the left (up) to decrease pressure. Turn wheel to the right (down) to increase pressure.

Unless otherwise specified, Valves with Hand Wheel will always be furnished.

These Valves are made with combination flanged and screwed base. Hexagon screwed base furnished, when so ordered, at the same price.

When Valves larger than 5 inches are required, we recommend using smaller Valves to equal as nearly as possible, the corresponding area of the large Valve. For convenience these may be attached to a Y base.

When these Valves are wanted for hot water service the order should so specify.

These Valves cannot be used as Shock Relief Valves.

When Relief Valves are wanted for systems where the working pressure is higher than 500 pounds, see page 201.

Relief Valves can be adjusted for pressures 20 per cent higher or lower than the pressure for which the Valve is purchased, but not in excess of the maximum set pressure given above.

For drilling templates; No. 1123, page 598; No. 1124, page 599.

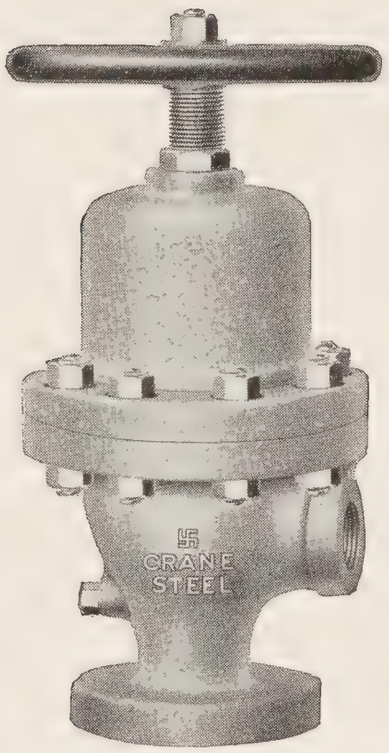
Price List for drilling; No. 1123, page 484.

HYDRAULIC RELIEF VALVES

THREE CLASSES OF VALVES WHICH WE WILL FURNISH
SET AT ANY PRESSURE SPECIFIED FROM 600 TO 3600 POUNDS

MADE IN SIZES
1½ TO 3 INCHES
INCLUSIVE

PRICES ON
APPLICATION



FOR USE ON
HYDRAULIC
PRESSES,
ELEVATORS,
PIPE LINES,
ETC.

No. 841-H FOR 800 POUNDS WORKING PRESSURE, 950 POUNDS MAXIMUM SET PRESSURE
FERROSTEEL BODY AND BONNET, HARD METAL SEAT AND DISC
CODE: DEPSANTUR

No. 1241-H FOR 1200 POUNDS WORKING PRESSURE, 1500 POUNDS MAXIMUM SET PRESSURE
CAST STEEL BODY AND BONNET, MONEL METAL SEAT AND DISC
CODE: DERADUNTUR

No. 3041-H FOR 3000 POUNDS WORKING PRESSURE, 3600 POUNDS MAXIMUM SET PRESSURE
CAST STEEL BODY AND BONNET, MONEL METAL SEAT AND DISC
CODE: DERMALGIA

Hydraulic Relief Valves should be set 20% higher than the maximum operating pressure of the installation. This will insure against wastage of pressure caused by Valves relieving when not necessary to safeguard the system.

Hydraulic Relief Valves can be adjusted for pressures 20% above and below the pressure for which the Valve is purchased, but not in excess of maximum set pressure given above.

These Valves are made of superior materials with long and durable springs of best quality steel. They are furnished with flanged inlets and screwed outlets, unless otherwise ordered.

When Valves larger than 3 inch are required, we recommend using smaller valves to equal, as nearly as possible, the area of the large valve. For convenience these may be attached to a Y Base.

These Valves can not be used as Shock Relief Valves.

For drilling templates for 800 pounds working pressure, see page 599.

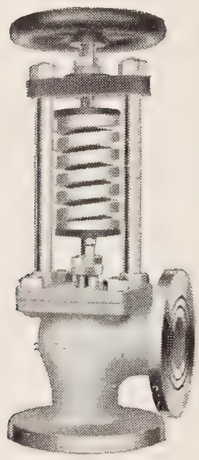
BRASS RELIEF VALVES

OUTSIDE SPRING AND YOKE AND BOLTED BONNET TYPE

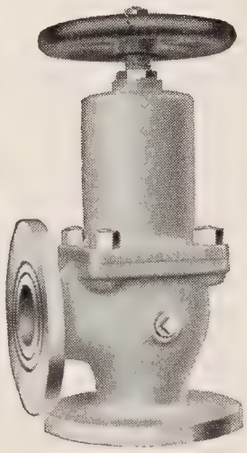
BRASS BODY — BRASS OR MONEL METAL SEAT

SET FOR STEAM PRESSURES FROM 5 TO 250 POUNDS

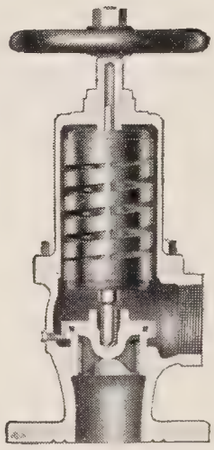
SET FOR WATER PRESSURES FROM 5 TO 300 POUNDS



No. 1137½
CODE: DEROGHIAMO



No. 1141
CODE: DERUPTARUM



No. 1142
CODE: DESACANHAR

No. 1137 FLANGED INLET AND SCREWED OUTLET
No. 1137½ FLANGED INLET AND FLANGED OUTLET
No. 1139 SCREWED INLET AND SCREWED OUTLET
No. 1140 SCREWED INLET AND SCREWED OUTLET
No. 1141 FLANGED INLET AND FLANGED OUTLET
No. 1142 FLANGED INLET AND SCREWED OUTLET

Size.....Inches	1½	2	2½	3
Size.....Millimeters	38	50	64	76
No. 1137 Brass Seat.....Each	100.00	115.00	145.00	200.00
No. 1137 Monel Metal Seat.....Each	115.00	130.00	164.00	223.00
No. 1137½ Brass Seat.....Each	110.00	128.00	162.00	223.00
No. 1137½ Monel Metal Seat.....Each	125.00	143.00	181.00	246.00
No. 1139 Brass Seat.....Each	90.00	102.00		
No. 1139 Monel Metal Seat.....Each	105.00	117.00		
No. 1140 Brass Seat.....Each	90.00	102.00		
No. 1140 Monel Metal Seat.....Each	105.00	117.00		
No. 1141 Brass Seat.....Each	110.00	128.00	162.00	223.00
No. 1141 Monel Metal Seat.....Each	125.00	143.00	181.00	246.00
No. 1142 Brass Seat.....Each	100.00	115.00	145.00	200.00
No. 1142 Monel Metal Seat.....Each	115.00	130.00	164.00	223.00

When ordering, specify the number and state the pressure at which valves are wanted set to relieve, and whether brass or monel seats are wanted.

Valves with brass seats will always be furnished unless monel seats are specified.

These valves can be recommended for a steam working pressure up to 250 pounds maximum and a water working pressure of 250 pounds with a maximum set pressure of 300 pounds.

All relief valves for water or oil should be set 20 per cent above the working pressure of the installation.

All relief valves can have their pressure changed 20 per cent above or below the set pressure for which the valve is purchased, but not in excess of maximum set pressure given above.

These valves have popping chambers which give them a more positive action than ordinarily found in relief valves and the regulating ring permits slight changes in the drop of pressure. These changes can be made without taking the valve apart.

To adjust for different pressures, loosen locknut, turn handwheel to the right to increase pressure, to the left to decrease pressure and tighten locknut.

To regulate the drop of pressure, remove locking plug, turn regulating ring to the right to INCREASE blow back and to the left to DECREASE blow back, and replace the locking plug.

These valves can be furnished for wrench adjustment with removable caps or with lifting levers; when so ordered at an extra price.

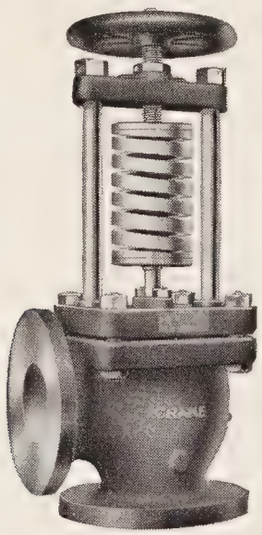
Price list for drilling, page 484. Templates for drilling, page 595.

OUTSIDE SPRING AND YOKE RELIEF VALVES

FOR STEAM AND WATER

IRON BODY **BRASS OR MONEL METAL SEAT**

SET FOR STEAM PRESSURES FROM 5 TO 250 POUNDS MAXIMUM
SET FOR WATER PRESSURES FROM 5 TO 300 POUNDS MAXIMUM



No. 1113 FLANGED INLET AND FLANGED OUTLET
CODE: DESARMOLAS

No. 1114 FLANGED INLET AND SCREWED OUTLET
CODE: DESBOQUE

No. 1115 SCREWED INLET AND SCREWED OUTLET
CODE: DESCABELLO

Size.....Inches	2	2½	3	3½	4	4½
Size.....Millimeters	50	64	76	90	100	113
Nos. 1113, 1114 and 1115 Brass Seats, Ea.	63.00	84.00	100.00	136.00	155.00	205.00
Nos. 1113, 1114 and 1115 Monel Seats, Ea.	68.00	90.00	107.00	143.00	167.00	220.00

When ordering, specify the number of Valve and state the Pressure at which Valves are wanted to relieve, also whether Brass or Monel Seats are wanted.

Valves with Brass Seats will always be furnished unless Monel Seats are specified.

Valves can be recommended for a Steam Working Pressure up to 250 pounds maximum and a Water Working Pressure of 250 pounds with a maximum set pressure of 300 pounds.

All Relief Valves for Water or Oil should be set 20% above the working pressure of the installation.

All Relief Valves can have their pressure changed 20% above or below the set pressure for which the Valve is purchased, but not in excess of the maximum set pressures given above.

These valves have popping chamber, which give them a more positive action than ordinarily found in Relief Valves, and the regulating ring permits slight changes in the drop of pressure. These changes can be made without taking the valve apart.

To adjust for different pressures, loosen locknut, turn handwheel to the right to increase pressure, to the left to decrease pressure and then tighten locknut.

To regulate the drop of pressure, remove locking plug, turn regulating ring to the right to increase blow-back and to the left to decrease blow-back, and replace the locking plug.

These Valves can be furnished for wrench adjustment with removable lock-up-caps or with lifting levers; when so ordered, at an extra price.

For general dimensions, see page 634.
Templates for drilling, see page 598.
Price List for drilling, see page 484.

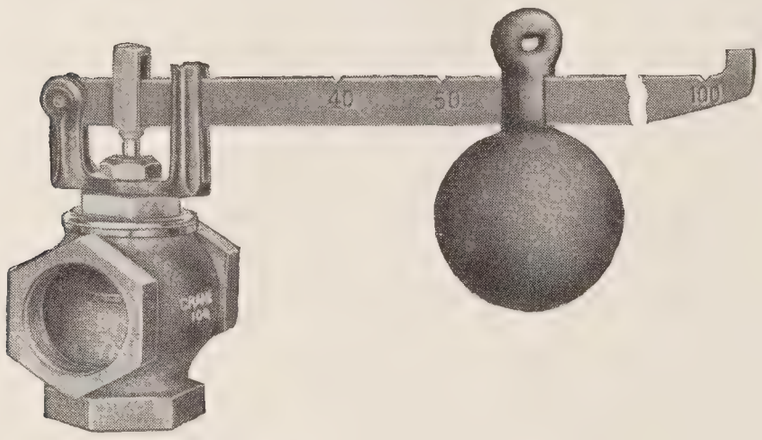
LEVER AND WEIGHT

SAFETY VALVES

BRASS

ANGLE AND CROSS

FOR STEAM WORKING PRESSURES FROM 5 TO 100 POUNDS



No. 40

CODE: DESCOGIAN

SCREWED

Size.....Inches	1/4	3/8	1/2	3/4	1
Size.....Millimeters	6	10	13	19	25
No. 40, Cross Safety Valve.....Each	2.20	2.50	3.25	3.90	4.70
No. 42, Angle Safety Valve.....Each		2.50	3.25	3.90	4.70
Size.....Inches	1 1/4	1 1/2	2	2 1/2	3
Size.....Millimeters	32	38	50	64	76
No. 40, Cross Safety Valve*.....Each	7.15	9.00	12.50	22.50	33.50
No. 42, Angle Safety Valve.....Each	7.15	9.00	12.50		

Levers are regularly graduated from 40 to 100 pounds. If desired, we can supply with other graduations to order, between 5 and 100 pounds pressure, at a special price.

*Cross Safety Valves, sizes 1¼ inch and larger, will be furnished in Iron, unless Brass is specified. Iron Valves listed on page 205.

THESE VALVES SHOULD NOT BE CONFUSED WITH SPRING-LOADED SAFETY VALVES OF MORE RECENT ORIGIN CONTAINING POP CHAMBERS. THEY HAVE NO POSITIVE OPENING AND CLOSING POINTS AND MUST BE SET 20 PER CENT HIGHER THAN THE WORKING PRESSURE REGULARLY CARRIED ON THE APPARATUS TO WHICH THEY ARE CONNECTED TO PREVENT A CONTINUOUS LEAKAGE PAST THE SEAT.

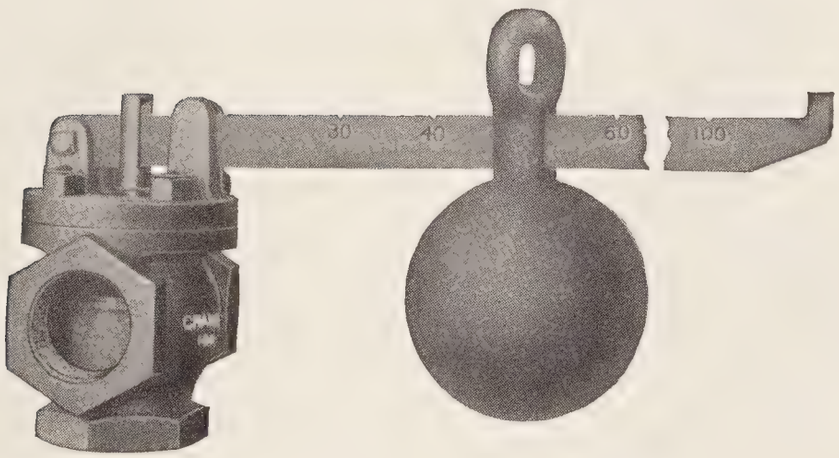
These Valves are not recommended for service on compressed air.

LEVER AND WEIGHT

SAFETY VALVES

IRON BODY **BRASS TRIMMINGS**

FOR STEAM WORKING PRESSURES FROM 5 TO 100 POUNDS



No. 376 CROSS

CODE: DESCOMUNAL

Size.....Inches	1¼	1½	2	2½	3	4	5	6
Size.....Millimeters	32	38	50	64	76	100	125	150
No. 376 Screwed.....Each	5.00	5.80	7.80	13.25	17.25	28.75	41.50	57.75

Levers are regularly graduated from 30 to 100 pounds. If desired, we can supply other graduations to order, between 5 and 100 pounds pressure, at a special price.

Sizes 1¼ to 2 inch have brass cap screwed into the body; 2½ inch and up have iron cap bolted to body.

THESE VALVES SHOULD NOT BE CONFUSED WITH SPRING-LOADED SAFETY VALVES OF MORE RECENT ORIGIN CONTAINING POP CHAMBERS. THEY HAVE NO POSITIVE OPENING AND CLOSING POINTS AND MUST BE SET 20 PER CENT HIGHER THAN THE WORKING PRESSURE REGULARLY CARRIED ON THE APPARATUS TO WHICH THEY ARE CONNECTED TO PREVENT A CONTINUOUS LEAKAGE PAST THE SEAT.

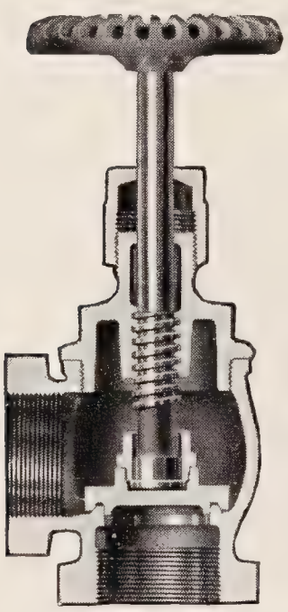
These Valves are not recommended for service on compressed air.

General dimensions of bodies, same as Cross Valves on page 601.

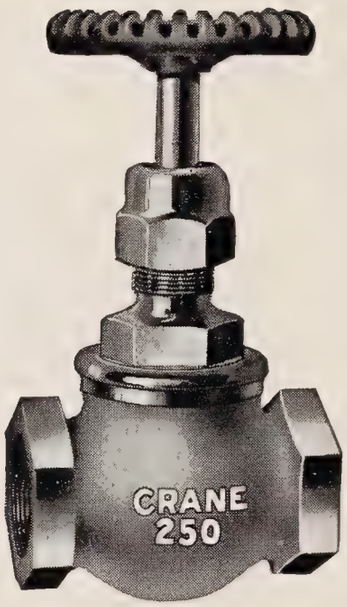
EXTRA HEAVY
HARD METAL (BRONZE)
BLOW-OFF VALVES
GLOBE AND ANGLE

SCREWED NON-HEATING WHEELS

FOR SATURATED STEAM WORKING PRESSURES UP TO 250 POUNDS



NO. 392 ANGLE
CODE: DESCOPASEN



NO. 392½ GLOBE
CODE: DESCORONAN

Size.....Inches	¾	1	1¼	1½	2
Size.....Millimeters	19	25	32	38	50
Price, Globe or Angle.....Each	2.50	3.50	5.00	7.00	10.00

Unless otherwise ordered, the angle pattern will be furnished.

To save the discs and seats from wear, Blow-Off Valves should always be opened wide when blowing off.

These Valves may be used wherever an extra heavy globe or angle Valve is wanted for handling dirty or gritty water.

DESCRIPTION

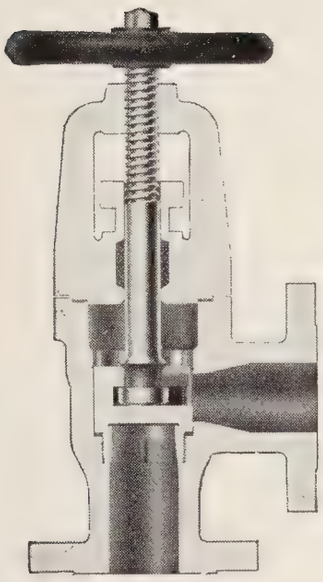
These Valves have the body and disc made of Crane "Hard Metal" which is almost as hard as Steel and they have successfully resisted the cutting effects of steam and water. The trimmings are made of "Crane Special Brass." The merits of these metals are further described on page 2.

We recommend these Valves for use as blow offs on small high pressure boilers and all other purposes where it is desirable to blow off dirty water, or water containing grit or sediment, under pressure.

WE CALL PARTICULAR ATTENTION TO THE CONSTRUCTION OF THE DISC AND SEAT IN THESE VALVES, FOR IT IS THE PECULIAR CONSTRUCTION OF THESE PARTS WHICH GIVE MERIT TO THIS VALVE FOR THE SERVICES OUTLINED ABOVE. THE POSSIBILITY OF SCALE AND DIRT LODGING ON THIS TYPE OF SEAT AND DISC IS MINIMIZED.

EXTRA HEAVY FERROSTEEL

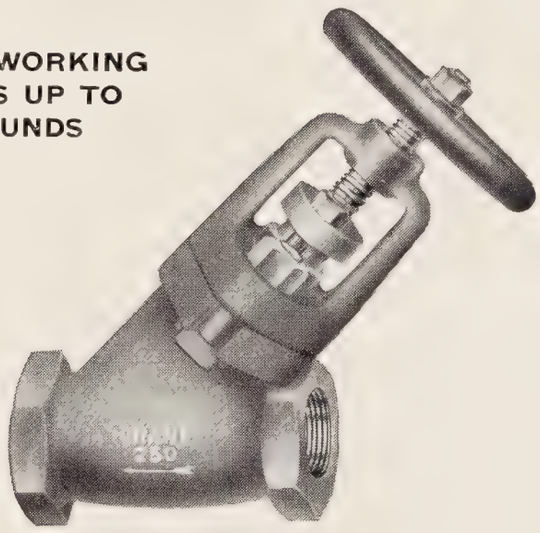
BLOW-OFF VALVES



No. 391 FLANGED
CODE: DESCUELGAN

No. 390 SCREWED
CODE: DESCOTOADO

FOR STEAM WORKING PRESSURES UP TO 250 POUNDS



No. 393 SCREWED
CODE: DESDANHADO

No. 393½ FLANGED
CODE: DESDEGNADO

Size	Inches	1½	2	2½	3
Size	Millimeters	38	50	64	76
No. 390, Angle, Screwed	Each	12.00	15.00	20.00	30.00
No. 391, Angle, Flanged	Each	12.00	15.00	20.00	30.00
No. 393, Screwed	Each	12.00	15.00	20.00	
No. 393½, Flanged	Each	12.00	15.00	20.00	
Diameter of Flanges	Inches	6	6½	7½	8¼
Center to Inlet or Outlet, Flanged, No. 391	Inches	4½	5	5¾	6⅝
Face to Face, Flanged, No. 393½	Inches	9⅞	11	12¼	
Nos. 393, 393½, Center of Valve to Rim of Hand Wheel when Valve is Open	Inches	12¾	13¼	15¼	

These Valves should always be installed so that the pressure will come on the top of the discs. They should also be opened wide when blowing off, so as to save the discs and seats from wear. These are very important points, as they concern the lasting qualities of the Valves.

DESCRIPTION

Valves of this style have been used generally for many years with entirely satisfactory results. From the nature of the service, Blow-Off Valves are likely to be cut out by scale or other boiler impurities, and it is essential to have a Valve which may be repaired rapidly and cheaply. To prevent too frequent repairing we make these Valves with a removable Iron Seat Ring, having the seating surface on the outside of the ring. The disc is also made of iron and is arranged to form a throttling lip with the body. This construction is designed to prevent the scale from lodging between the seat and disc. The use of iron for this service in seat and disc is the result of many years' experience with Valves of this type.

Templates for drilling, page 598. Price List for drilling, page 484.

EXTRA SEATS AND DISCS

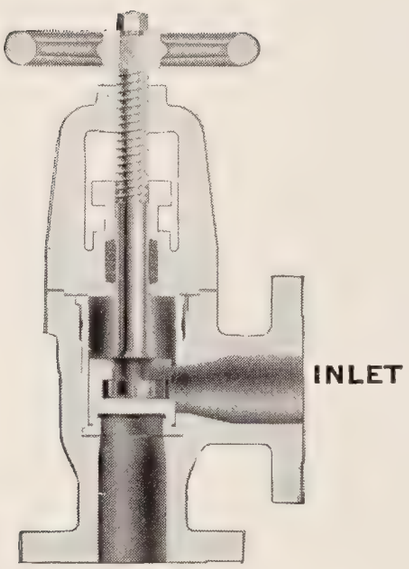
Size	Inches	1½	2	2½	3
Size	Millimeters	38	50	64	76
Extra Seat	Each	.65	.90	1.15	1.40
Extra Disc	Each	1.45	1.70	2.00	2.50

EXTRA HEAVY

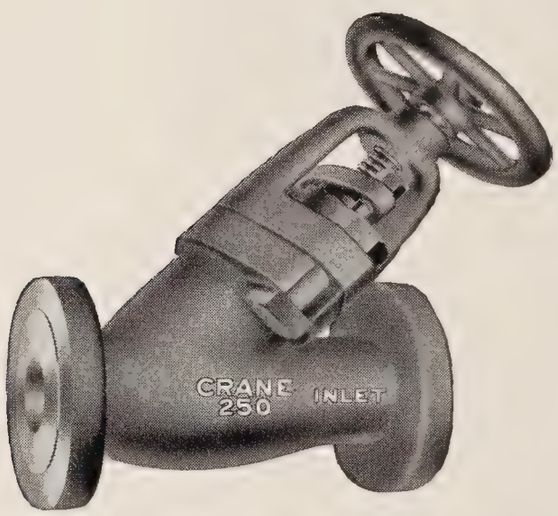
FERROSTEEL QUICK REPAIR

BLOW-OFF VALVES

FOR STEAM WORKING PRESSURES UP TO 250 POUNDS



No. 396½ ANGLE
FLANGED
CODE: DESGELIJKS



No. 399½ Y PATTERN
FLANGED
CODE: DESGRACOU

The No. 396½ Angle Pattern and No. 399½ Y Pattern are made to order only, in sizes 2, 2½ and 3 inch, either screwed or flanged. Prices on application.

They are made with ferrosteel body and bonnet, Hard Metal renewable seat and renewable iron disc.

Seat may be slipped into body (no threads) and has an opening the same size as the inlet of Valve.

Cranite gaskets at bonnet and seat joints.

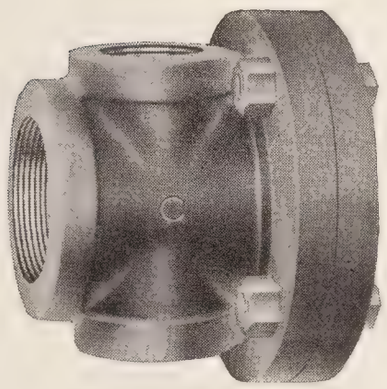
When made with Cast Steel body and bonnet and Monel Metal renewable seat these Valves are good for steam working pressures up to 300 pounds.

BLOW-OFF CROSSES

CAST IRON

STANDARD; FOR STEAM WORKING PRESSURES UP TO 125 POUNDS

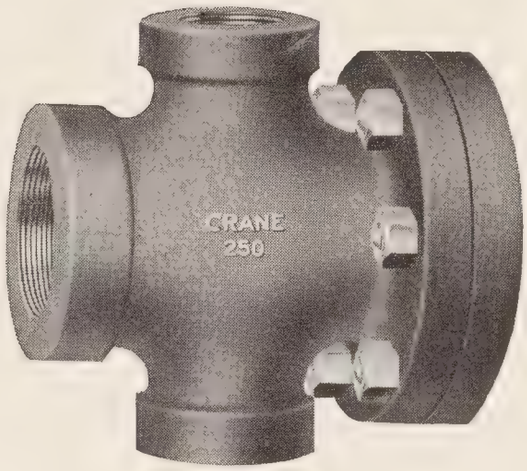
BOILER SIDE



STANDARD
CODE: DESHABITAR

EXTRA HEAVY; FOR STEAM WORKING PRESSURES UP TO 250 POUNDS

BOILER SIDE



EXTRA HEAVY
CODE: DESHERBADO

LIST PRICES OF STANDARD

Size.....Inches	2½x1½	2½x2	2½x2½	3x1½	3x2	4x2
Size.....Millimeters	64x38	64x50	64x64	76x38	76x50	100x50
Price.....Each	9.00	9.00	9.00	10.00	10.00	12.00
Size.....Inches	4x2½	5x2½	5x3	6x2½	6x3	
Size.....Millimeters	100x64	125x24	125x76	150x64	150x76	
Price.....Each	12.00	18.00	18.00	27.00	27.00	

LIST PRICES OF EXTRA HEAVY

Size.....Inches	2½x2½	3x2	4x2	4x2½
Size.....Millimeters	64x64	76x50	100x50	100x64
Price.....Each	12.00	13.50	16.00	16.00

The utility and convenience of this special fitting for feeding and blowing-off boilers will recommend itself.

It is most conveniently placed in the position as shown in illustration. The large openings on the run are of same size.

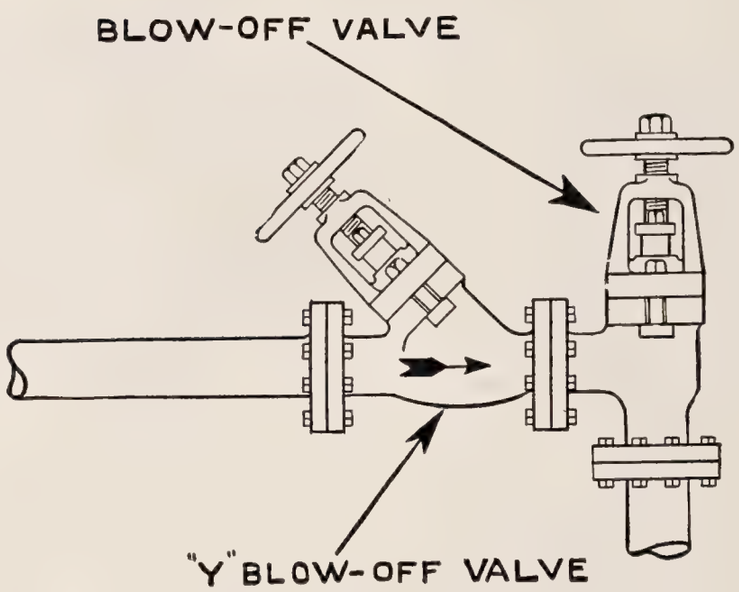
The reduced openings are usually of one size, but can be made to suit requirements. The reduced top inlet is used for feeding the boiler. To the lower reduced outlet the Blow-Off Valve or Cock is connected. The blind flange is removable for cleaning-out purposes.

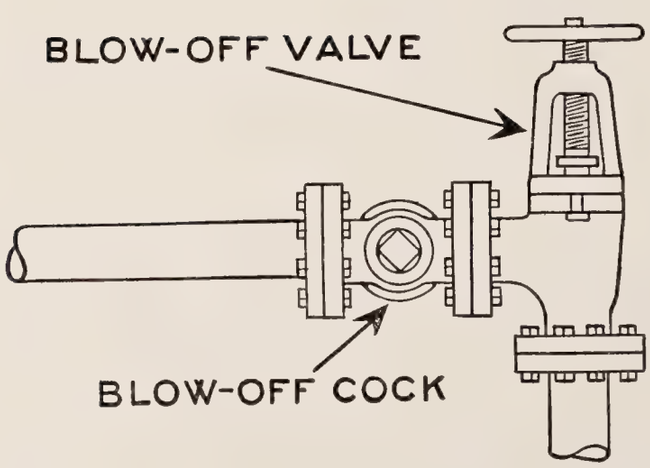
Other sizes of Extra Heavy Blow-Off Crosses made to order. Prices on application.

FOR LIST OF SIZES CARRIED IN STOCK, FOR STANDARD, SEE PAGE 693
FOR EXTRA HEAVY, SEE PAGE 702

HOW TO INSTALL

VALVES FOR BLOW-OFF LINES





Every blow-off outlet of each boiler in a battery should be equipped with a blow-off cock, or a Y blow-off valve, between the boiler and the blow-off valve, as shown above.

When blowing off a boiler, the cock or Y valve should be opened first, and the blowing-off operation controlled by the blow-off valve. When through blowing off, the blow-off valve should be closed first and then the cock or Y valve.

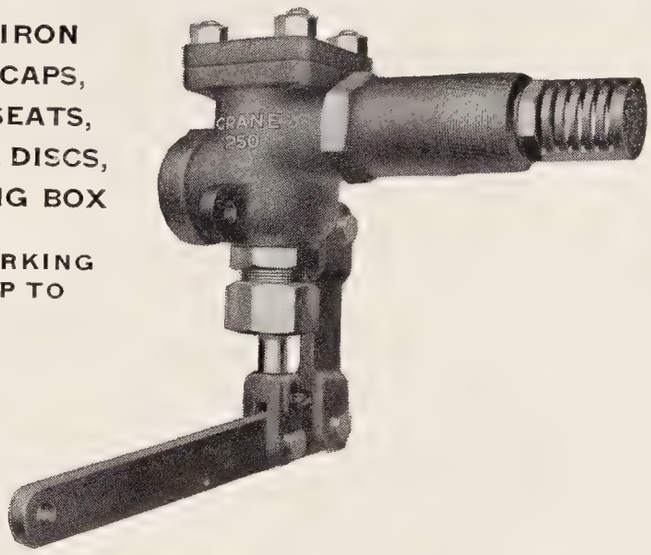
EXTRA HEAVY

LOCOMOTIVE BLOW-OFF VALVES

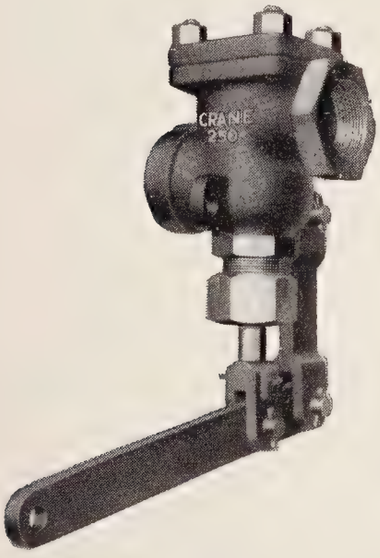
MALLEABLE IRON BODIES AND CAPS, REMOVABLE SEATS, FORGED STEEL DISCS, BRASS STUFFING BOX

FOR STEAM WORKING PRESSURES UP TO 250 LBS.

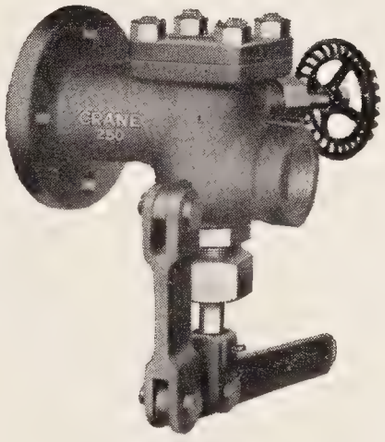
No. 1838
ASH PAN BLOWER
MADE IN 1½-INCH SIZE
CODE: DESHIJADO



No. 1844
TAPPED 2-INCH SIZE
MALE END SPECIAL
CODE: DESHINCHES



No. 1843
MADE IN 2-INCH SIZE
CODE: DESHILARLE



No. 1846
MADE IN 2-INCH SIZE
CODE: DESHONNEUR

Size.....Inches	1½	2
Price, No. 1838—Hard Metal Seat, Disc and Stem	21.25	
Price, No. 1838—Steel Seat, Disc and Stem	23.75	
Price, No. 1843—Steel Seat, Steel Disc, Brass Stem		47.50
Price, No. 1843—Steel Seat, Steel Disc, Steel Stem		43.50
Price, No. 1844—Steel Seat, Steel Disc, Brass Stem		54.00
Price, No. 1844—Steel Seat, Steel Disc, Steel Stem		50.00
Price, No. 1846—Steel Seat, Steel Disc, Brass Stem		85.00
Price, No. 1846—Steel Seat, Steel Disc, Steel Stem		81.00

These valves close automatically with the pressure. All wearing parts are readily renewable. This type of Valve has been thoroughly tried out, and the excellent service it is giving has resulted in its adoption as a Standard by prominent railroads. The comparatively low price and durable form of construction, combined with superior grades of material used, strongly recommend this as the most desirable and easiest operated Blow-Off Valve on the market.

Male threads on No. 1844 Valves are tapered 2¾ inches outside diameter, 12 threads per inch. Other male threads can be furnished to the Railroad Company's gauge. Brass Strainers for the male ends can be supplied on order. Prices upon application.

The Inlet Flange on No. 1846 Valves is 7¼ inches outside diameter with the male face 3½ inches in diameter, ⅛ inch high.

The No. 1838 Disc and Stem are of one-piece construction.

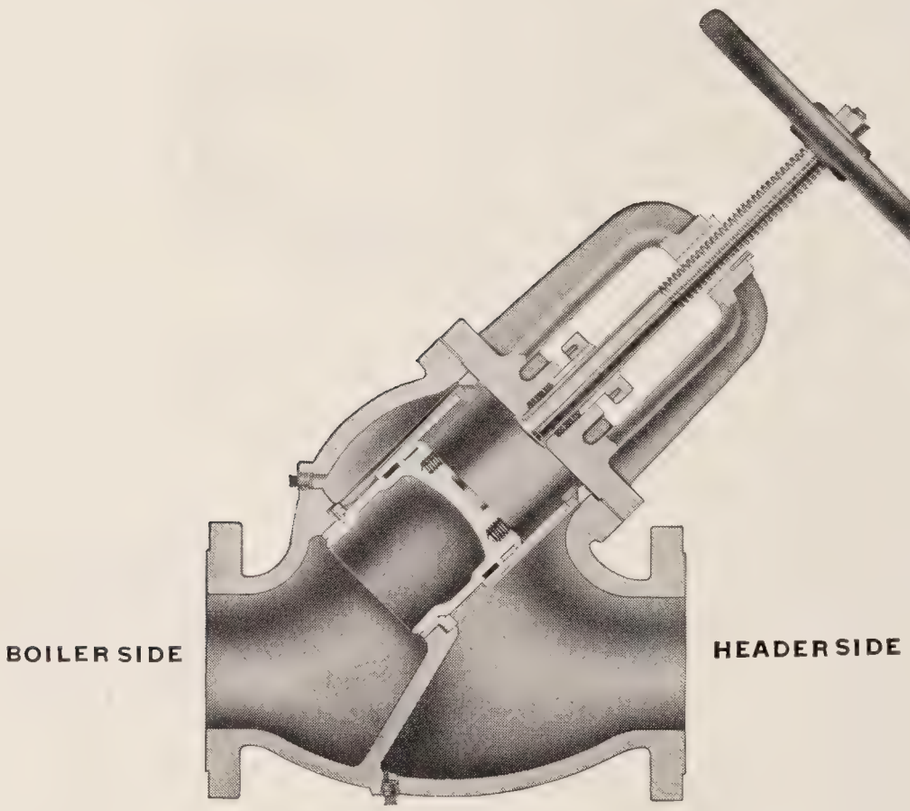
The Nos. 1843, 1844, 1846 Steel Disc and Stem are of one-piece construction.

The Nos. 1843, 1844, 1846 Steel Disc and Brass Stem are of two-piece construction.

CRANE Y PATTERN

AUTOMATIC STOP-CHECK VALVES

EXTRA HEAVY



All steam plants having more than one boiler should have one of these combination Stop-Check Valves, in the piping, between each boiler and the main steam line or header.

In the event of a tube blowing out in the boiler to which a Stop-Check Valve is connected, the valve will instantly and automatically close, cutting out the boiler, and acting as a non-return valve, prevent a back flow of steam from the main.

They also act as a Safety Stop-Valve, preventing any steam entering or backing into a closed boiler while men are at work inside.

Each Valve will open promptly and automatically when the boiler to which it is connected reaches the full pressure in the main, but will remain closed against a higher pressure in the main; consequently, a sluggish boiler may be readily detected and the firing given proper attention.

Valves should be installed so that the boiler pressure comes underneath the disc.

Crane Y Pattern Stop Check Valves will close on banked and cut out boilers as soon as there is a sufficient drop in the temperature of the heated portions of the boiler to stop making steam.

In plants where scale or sediment is a problem, care should be taken to keep these valves clean, in order that they function properly.

AUTOMATIC STOP-CHECK VALVES

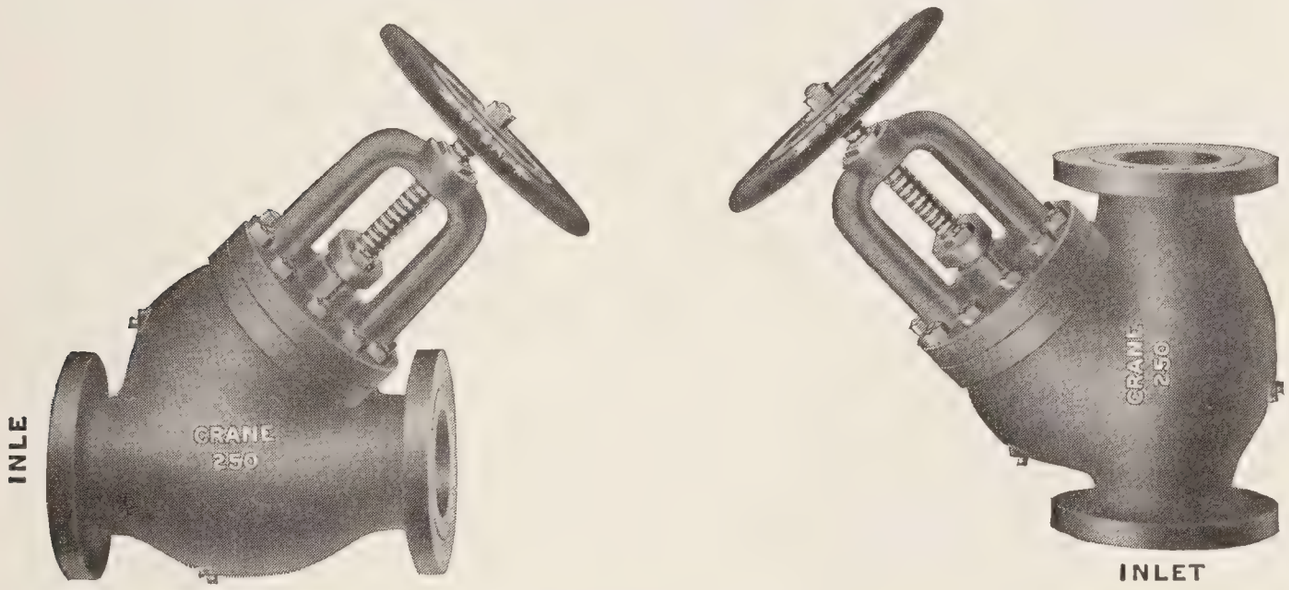
EXTRA HEAVY

FERROSTEEL BODY AND YOKE STEEL STEM

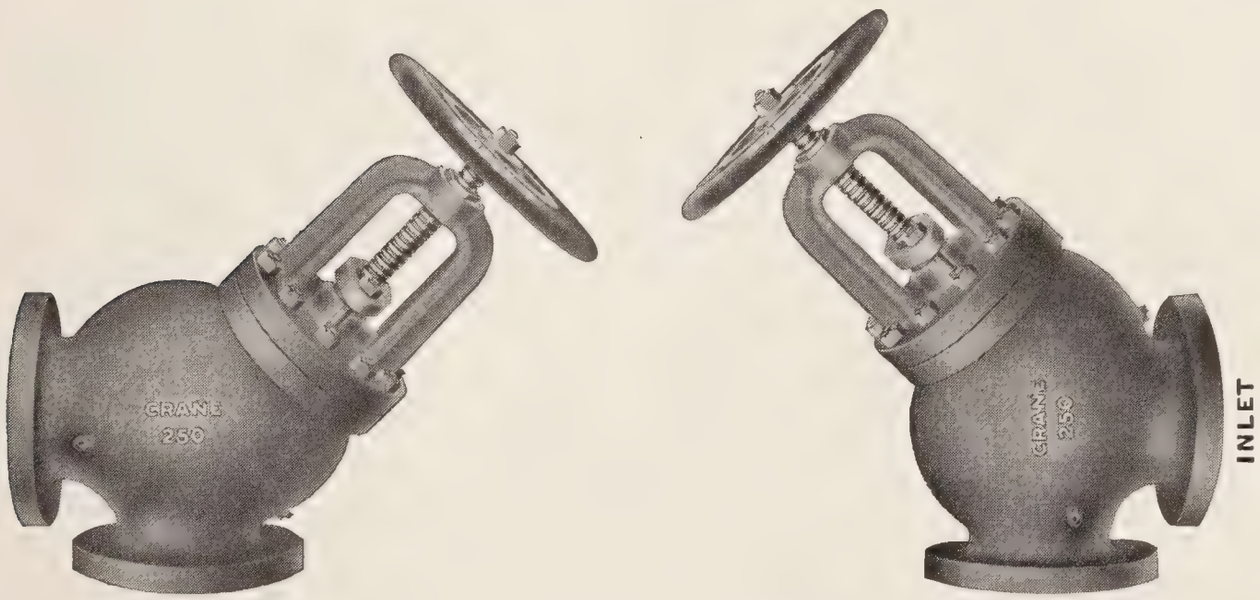
SEAT AND DISC OF HARD METAL (BRONZE) RENEWABLE SEAT

FOR SATURATED STEAM WORKING PRESSURES UP TO 250 POUNDS

FOR SUPERHEATED STEAM WORKING PRESSURES UP TO 250 POUNDS AND A TOTAL TEMPERATURE NOT TO EXCEED 500 DEGREES FAHR.



No. 28 E, STRAIGHT Y
USED IN HORIZONTAL AND VERTICAL LINES
CODE: DESHUMANEM



No. 30 E, ANGLE Y
USED IN EITHER POSITION
CODE: DESIDIARUM

Size.....Inches	2½	3	4	5	6	7	8	10
Size.....Millimeters	64	76	100	125	150	175	200	250
No. 28E, Str. Flgd.... Each	45.00	50.00	60.00	80.00	95.00	120.00	145.00	240.00
No. 30E, Angle Flgd.. Each	45.00	50.00	60.00	80.00	95.00	120.00	145.00	240.00

Screwed Valves 2½ to 6 inch will be furnished at the same price.

When ordering Stop-Check Valves it is good policy to give the horse power and working pressure of the boiler on which the Valve is to be used.

These Stop-Check Valves conform to the requirements of the A. S. M. E. Boiler Code.

For general dimensions, see page 626.

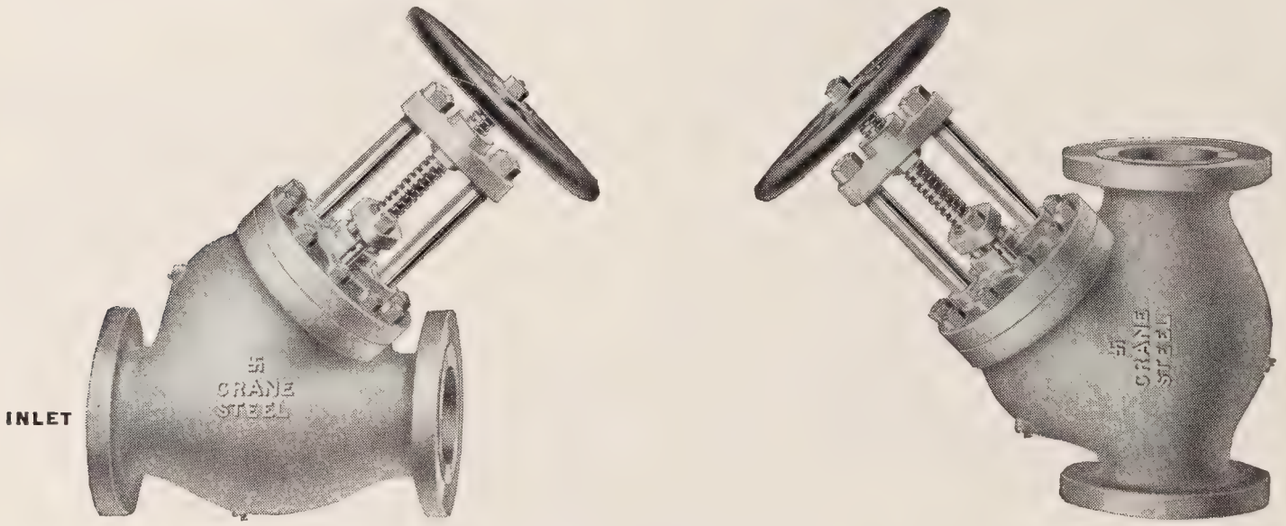
For drilling templates, see page 598. Price List for drilling, see page 484.

CAST STEEL
AUTOMATIC STOP-CHECK VALVES

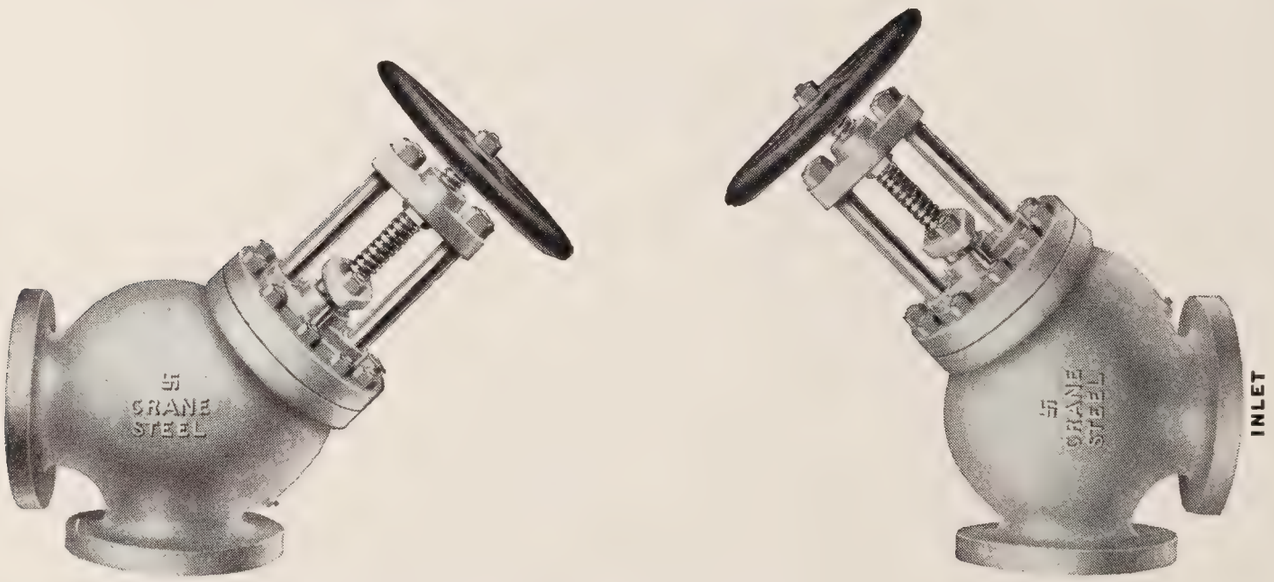
CAST STEEL BODY AND YOKE
MONEL METAL SEAT
MONEL METAL DISC
MONEL METAL STEM
FOR SUPERHEATED STEAM UP TO 350 POUNDS WORKING PRESSURE AND A TOTAL TEMPERATURE OF 800 DEGREES FAHRENHEIT

STEEL BOLTS OF HIGH TENSILE STRENGTH or commercial bolts larger in diameter must be used on the end flanges when valves are subjected to steam working pressures in excess of 300 lbs.

A. S. M. E. EXTRA HEAVY BOLTING using commercial bolts is not strong enough for steam working pressures in excess of 300 lbs.



No. 28-A. STRAIGHT Y
USED IN HORIZONTAL OR VERTICAL LINES
CODE: DESINFATUA



No. 30-A. ANGLE Y
USED AS SHOWN IN CUTS WITH INLET ON BOTTOM OR SIDE
CODE: DESISCADO

Size.....Inches	2½	3	4	5
Size.....Millimeters	64	76	100	125
No. 28-A, Straight, Flanged.....Each	97.50	120.00	160.00	195.00
No. 30-A, Angle, Flanged.....Each	97.50	120.00	160.00	195.00
Size.....Inches	6	7	8	10
Size.....Millimeters	150	175	200	250
No. 28-A, Straight, Flanged.....Each	245.00	295.00	375.00	575.00
No. 30-A, Angle, Flanged.....Each	245.00	295.00	375.00	575.00

For general dimensions, see page 626.
For drilling templates, see page 598. Price List for drilling, page 485.
Valves furnished with 1/16 inch Raised Face. For diameters, see page 665.

CRANE-ERWOOD AUTOMATIC DOUBLE ACTING NON-RETURN AND EMERGENCY CUT-OUT VALVES

EXTRA HEAVY

(PATENTED)

PRINCIPAL DUTIES OF THE CRANE-ERWOOD VALVE

BOILER PROTECTION

When a Crane-Erwood Valve is installed between the boiler and the header of a steam plant, should an accident happen, reducing the pressure in the boiler, the Valve will close automatically and prevent steam from the header flowing into the boiler.

HEADER PROTECTION

When a Crane-Erwood Valve is installed between the boiler and the header of a steam plant, should an accident happen, reducing the pressure in the header or the steam lines, the Valve will close automatically and prevent steam from the boiler flowing into the header or steam lines.

ADDITIONAL DUTIES

In addition to the two important duties, i. e., boiler and header protection, Crane-Erwood Valves will also perform the following additional duties:

CUTTING IN

Each Valve will open automatically when the boiler to which it is connected reaches the full pressure in the main, but will remain closed against a higher pressure in the main.

When the Valve has closed automatically, due to a break or sudden reduction in pressure beyond the outlet of the Valve, it will open automatically when the pressure in the header or main steam pipe again equals that of the boiler. This is done through the medium of the by-pass which should be open at all times, except when it becomes necessary to cut out the header from the boiler on account of breaks or shut-downs.

GENERAL INFORMATION

The levers on the outside of the Valve are in line with the discs and give a positive indication of their position and the operation of the Valve at all times.

As the discs move with the adjusting arm, the shortening of the connecting link between the two arms farther separates the discs and makes the Valve more sensitive to closing, and lengthening the connecting links between the adjusting arms brings the discs closer together, thereby allowing higher velocity through the Valve.

RECOMMENDED STEAM VELOCITIES

When applying Crane-Erwood Valves to boiler leads, i. e., between the boiler and the header, the size of the Valve should be determined on a maximum steam velocity of 2,500 feet per minute at normal boiler horsepower. Higher steam velocities will cause the Valve to become too sensitive and cause premature closing of the Valve on the header side.

When using Crane-Erwood Valves as automatic line protection Valves, on pipe lines from the main header, the maximum velocity under full load conditions should not exceed 4,000 feet per minute. It is important that the steam velocities mentioned be not exceeded.

Crane-Erwood Valves are ideal protection Valves in plants where the load on the boilers is fairly constant, such as batteries of heating boilers or plants generating their own power with turbines, if the demand for power is constant.

In any plant where there is likelihood of sudden variations in load causing excessive pull on the boilers, a Crane-Erwood Valve or any type of triple duty Valve should not be used.

CRANE-ERWOOD

AUTOMATIC DOUBLE ACTING

NON-RETURN AND EMERGENCY CUT-OUT VALVES

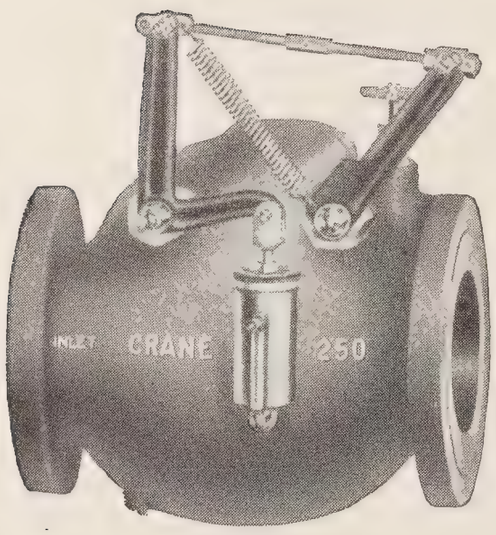
(PATENTED)

EXTRA HEAVY

FERROSTEEL BODY — HARD METAL (BRONZE) SEATS AND DISCS

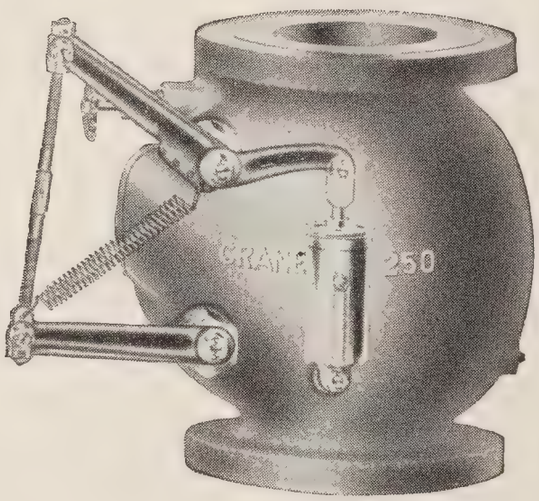
FOR SATURATED STEAM WORKING PRESSURES UP TO 250 POUNDS

FOR SUPERHEATED STEAM WORKING PRESSURES UP TO 250 POUNDS AND A TOTAL TEMPERATURE NOT TO EXCEED 500 DEGREES FAHR.



No. 36E. HORIZONTAL

CODE: DESJEJOUAR



INLET

No. 37E. VERTICAL
UPWARD FLOW

CODE: DESLASTRAR

Size.....Inches	4	5	6	7	8	10
Size.....Millimeters	100	125	150	175	200	250
No. 36 E, Horizontal.....Each	120.00	150.00	180.00	210.00	240.00	400.00
No. 37 E, Vertical.....Each	120.00	150.00	180.00	210.00	240.00	400.00

Vertical type Valves are the same general design and dimensions as the horizontal, but differ as to the location and position of the outside operating parts, and are made for upward flow only. When ordering Vertical, be particular to specify Vertical No. 37 E, otherwise Horizontal No. 36 E will always be furnished.

For general dimensions, see page 627.

For drilling templates, see page 598. Price List for drilling, page 484.

CAST STEEL

CRANE-ERWOOD

AUTOMATIC DOUBLE ACTING

NON-RETURN AND EMERGENCY CUT-OUT VALVES

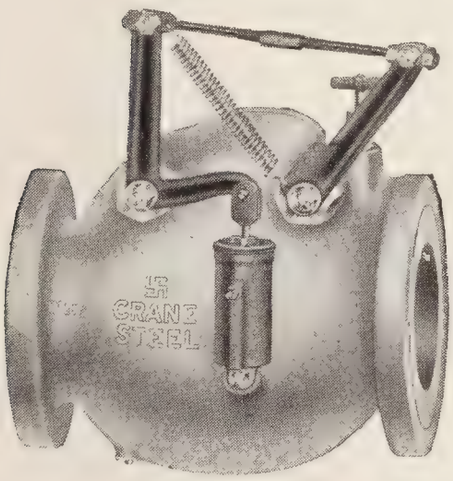
(PATENTED)

CAST STEEL BODY **MONEL METAL SEATS AND DISCS**

FOR SUPERHEATED STEAM UP TO 350 POUNDS WORKING PRESSURE AND A TOTAL TEMPERATURE OF 800 DEGREES FAHRENHEIT

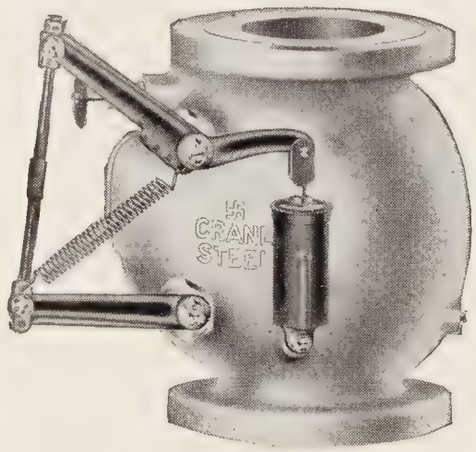
STEEL BOLTS OF HIGH TENSILE STRENGTH or commercial bolts larger in diameter must be used on the end flanges when valves are subjected to steam working pressures in excess of 300 lbs.

A. S. M. E. EXTRA HEAVY BOLTING using commercial bolts is not strong enough for steam working pressures in excess of 300 lbs.



No. 36A. HORIZONTAL

CODE: DESLENDEAR



INLET

No. 37A. VERTICAL

UPWARD FLOW

CODE: DESLODAREM

Size.....Inches	4	5	6	7	8	10
Size.....Millimeters	100	125	150	175	200	250
No. 36A, Horizontal.....Each	275.00	315.00	360.00	420.00	480.00	800.00
No. 37A, Vertical.....Each	275.00	315.00	360.00	420.00	480.00	800.00

Vertical Type Valves are the same general design and dimensions as the horizontal, but differ as to the location and position of the outside operating parts and are made for upward flow only. When ordering Vertical, be particular to specify Vertical No. 37A, otherwise Horizontal No. 36A will always be furnished.

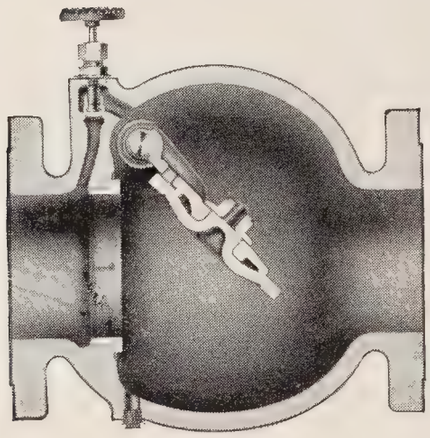
For general dimensions, see page 627.

For drilling templates, see page 598. Price List for drilling, page 485.

Furnished with $\frac{1}{16}$ inch Raised Face. For diameters, see page 665.

EXTRA HEAVY

EMERGENCY STOP VALVE



This valve may be closed instantly when necessary and the closing may be accomplished from one or several points. It is simple in construction, has few parts, and is not likely to get out of order. It may be operated as often as desired to show that it is always ready for instant use.

The design is that of a Swing Check Valve with the flow against the back of the disc.

The disc is attached to a shaft which extends to the outside of the valve through a stuffing box. A lever is attached to the shaft, one end of which engages with the releasing device (hand or electrical), and a weight is attached to the other end of the lever to give quick action to the closing of the valve. A by-pass is provided as it is necessary to equalize the steam pressure on both sides of the disc before the valve can be opened after it has been closed when under pressure.

A drain is provided to relieve condensation.

The valve may be installed in a vertical or horizontal position, or at any angle, by placing the lever so the disc will open and close properly.

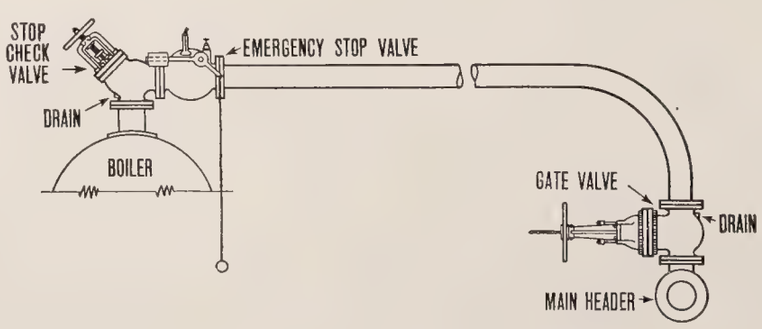
The disc is held in the open position by the releasing device. The releasing device is operated either by a cord or electrical push-button. To close the valve, the cord is pulled or the button pushed and the weight on the lever brings the disc into the path of the steam and it is closed instantly.

LINE PROTECTION VALVE

The emergency valve is ideal for line protection. Placed close to the steam header it may be arranged with cables to be tripped from any reasonable distance or location, or if valve be equipped with solenoid the push buttons (any reasonable number) may be located at convenient and safe points.

The Nos. 46-E and 46½-E valves were first made as emergency engine stop valves; however, their application was so successful that their use should not be confined to engine leads only, as they are applicable in many pipe lines throughout a power plant equipment. At bottom of page is illustrated one very desirable application of this valve.

The frequency of accidents which require shutting down the engine instantly has lead several States to require by law a quick-closing engine stop valve on the steam lead to each engine. The Crane Emergency Stop Valve meets the requirements.



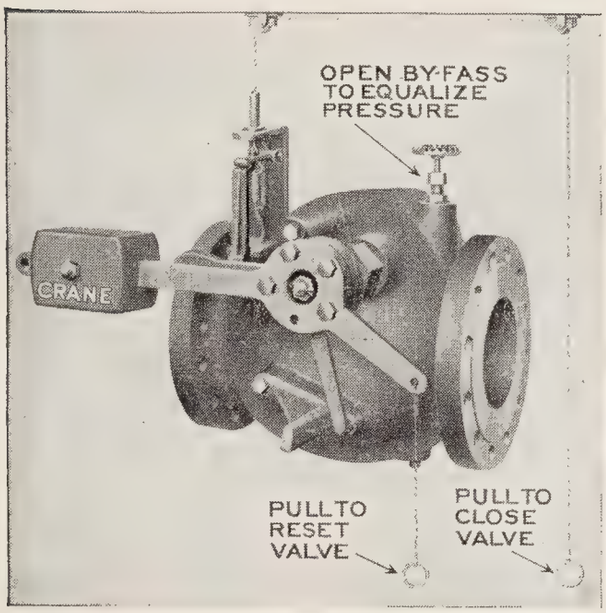
EXTRA HEAVY
EMERGENCY STOP VALVE

PATENT APPLIED FOR

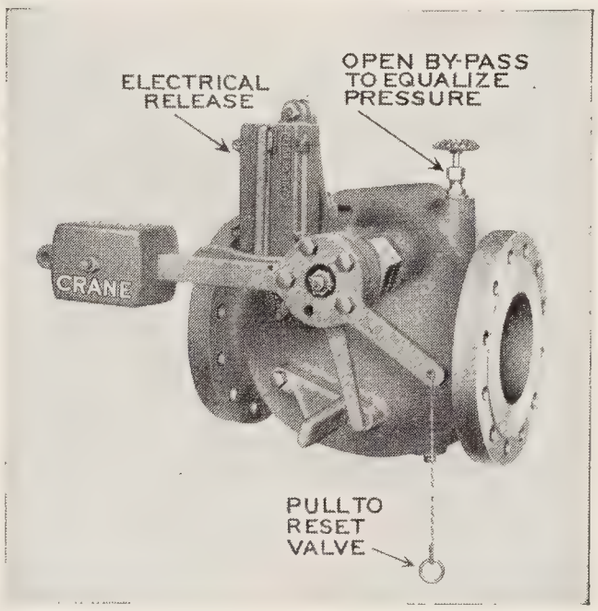
FERROSTEEL BODY AND COVER HARD METAL (BRONZE) SEAT AND DISC
MANGANESE BRONZE HINGE AND STEM

FOR SATURATED STEAM WORKING PRESSURES UP TO 250 POUNDS

FOR SUPERHEATED STEAM WORKING PRESSURES UP TO 250 POUNDS AND A TOTAL TEMPERATURE NOT TO EXCEED 500 DEGREES FAHR.



No. 46-E
HAND RELEASE
CODE: DESMADEJEN



No. 46½-E
ELECTRICAL RELEASE FOR REMOTE CONTROL
CODE: DESORBEBAS

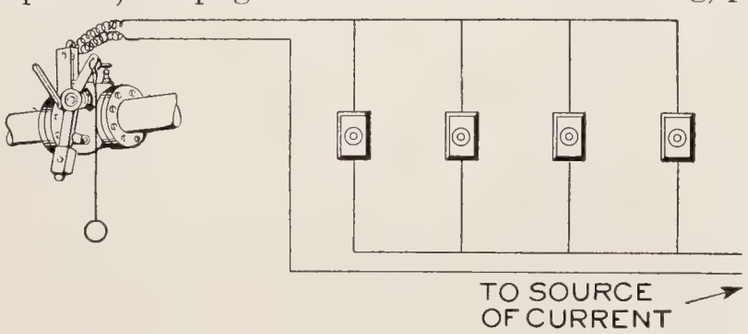
Size.....Inches	3	4	5	6	7	8	10
Size.....Millimeters	76	100	125	150	175	200	250
No. 46-E, Hand Release..Each	90.00	100.00	120.00	145.00	175.00	210.00	260.00
No. 46½-E, Elec. Release. Each	135.00	145.00	165.00	190.00	220.00	255.00	305.00
Face to Face.....Inches	13½	14	15¾	17½	19¼	21	24½
Diameter of Flanges...Inches	8¼	10	11	12½	14	15	17½

The prices given above include the releasing device mounted on valve. No chain, pulleys, wires or push buttons are furnished.

Inquiries and orders should specify whether valve is for use in horizontal or vertical pipe and whether for upward or downward flow, also specify voltage, kind of current, whether direct or alternating and number of cycles.

When made of Cast Steel with Monel Metal seats and discs these valves are good for superheated steam up to 300 pounds working pressure and a total temperature of 750 degrees Fahrenheit.

For drilling templates, see page 598. Price List for drilling, page 484.



WIRING DIAGRAM FOR ELECTRICAL RELEASE
PUSH BUTTONS OR SWITCHES MAY BE LOCATED ANYWHERE

MOTOR OPERATED GATE VALVES

GENERAL DESCRIPTION

These Valves are manufactured in sizes 4 to 72-inch, inclusive, for all conditions of pressure and service. Any of the various lines of Crane iron body and steel gate valves can be supplied with motor.

Sizes 24-inch and smaller are furnished with outside screw and yoke unless otherwise ordered.

Sizes larger than 24-inch are furnished with inside screw non-rising stem unless otherwise ordered. Non-rising stem valves are made with an indicator to show the position of the disc.

The valve is operated from the motor through a train of reduction gears. All parts of the motor drive, including the limit switch are mounted on pads cast on the outside of the yoke. These valves have no more inside parts than a hand operated valve. A hand wheel is provided for operating the valve by hand when so desired.

The motors used for valve operation can be started on full voltage without the use of resistance or compensating starter. They have sufficient power to operate the valve under any conditions for which the valves are built. Motors can be furnished for direct or alternating current of standard voltages. They are of the totally enclosed type which insures protection from moisture and dirt.

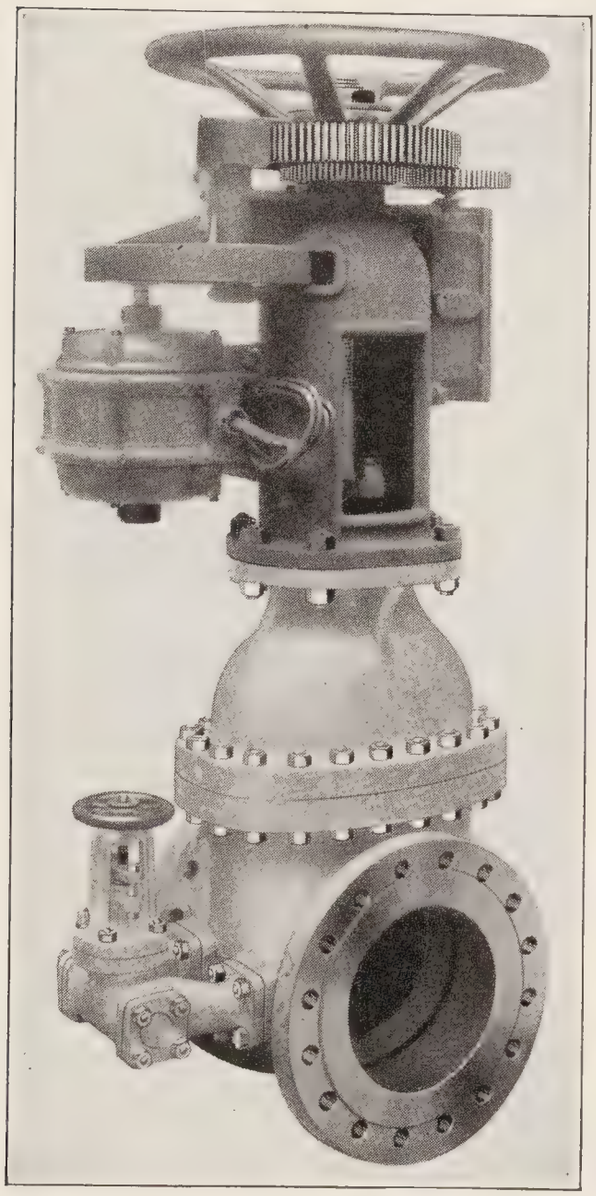
The limit switch which automatically stops the motor when the valve is tightly seated or fully open, is of the enclosed type and has a removable gasketed cover. The electrical contacts are made of non-corrosive metal and are not affected by heat or moisture. The switch is capable of fine adjustment and is so constructed that the adjustment cannot change in operation.

The operation of the valve is controlled by a hand control box equipped with indicator lights which show whether the valve is open, partly open or closed. Any number of these stations can be used for operating the valve or valves for either short distance or remote control.

MOTOR OPERATED

GATE VALVES

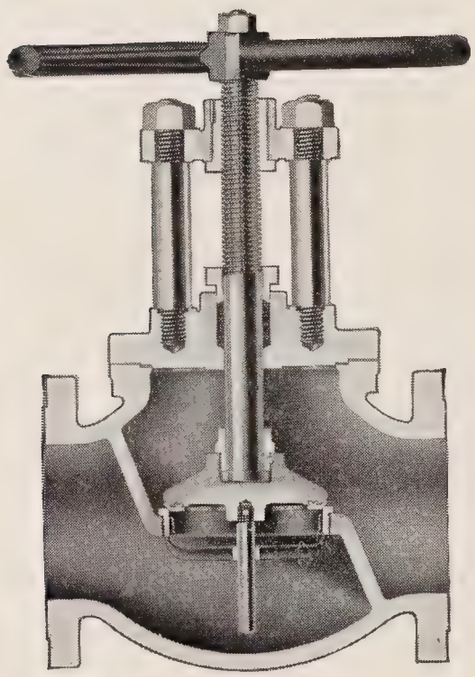
(PATENTED)



Orders or inquiries for prices should give the following information:

1. Working pressure.
2. Description of service valves are to be used for.
3. Sketch showing position in which valve is placed in line.
4. Are valves to be supplied with By-pass.
5. If direct current, give voltage.
6. If alternating current, give voltage, cycles and phase.
7. Specify type of control, whether short distance or remote, and whether single or multi station control.
8. If remote, give distance control station or stations are to be located from valve.
9. If more than one valve is to be used, state whether all valves will be operated from one station, from separate stations, or both.

VALVES FOR SOOT BLOWER SYSTEMS



Because of the severe service, commercial valves do not always prove satisfactory on soot blower lines. Steam at boiler pressures (usually superheated steam, when it is available) is blown through the valves over the tubes. The velocity of this steam through the valves is exceedingly high, and the erosive effect of this steam soon damages the seating surface of the valves. The arrangement of the piping between the tubes in some types of soot blowers allows the furnace gases to follow the inside of the soot blower pipes back to the individual controlling valve. These gases have a deteriorating effect on the internal parts of the valve due to the moisture which later accumulates.

Because of the extreme difference in temperatures, on account of location of valves in the piping installation, they often leak after steam is blown through them, due to the contraction of the valve parts.

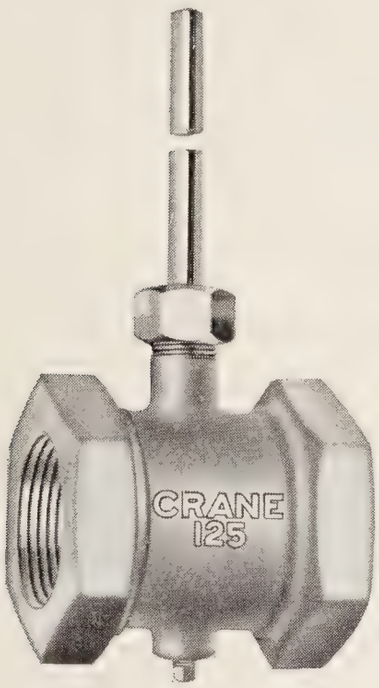
To overcome these difficulties we recommend that the soot blower piping be arranged with open drains and that specially designed soot blower valves be used at certain points in the system.

A sketch showing the piping and locations of the valves to be used will assist in making recommendations.

STANDARD

BUTTERFLY VALVES

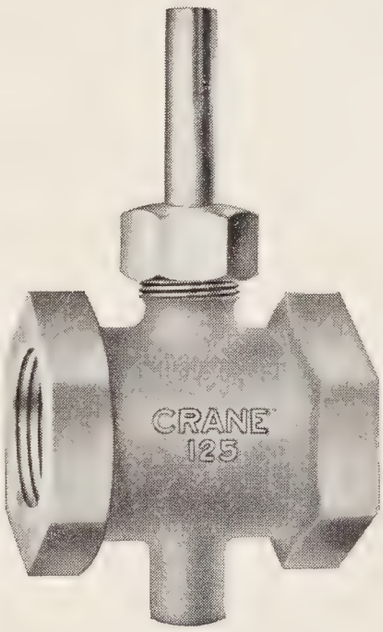
FOR STEAM WORKING PRESSURES UP TO 125 POUNDS



No. 44
BRASS

CODE: DESRANCHEN

These valves are not built to close steam tight.



No. 380
IRON BODY
BRASS DISC

CODE: DESUDANDUM

No. 44—BRASS

Size.....Inches	¾	1	1¼	1½	*2	*2½	*3
Size.....Millimeters	19	25	32	38	50	64	76
Price.....Each	3.10	4.40	5.65	6.75	10.00	13.75	21.00

*Always specify Brass Butterfly Valves if Brass is required, otherwise sizes 2-inch and larger will be furnished in iron body type.

No. 380—IRON BODY

Size.....Inches	2	2½	3	3½	4	5
Size.....Millimeters	50	64	76	90	100	125
No. 380, Screwed.....Each	8.00	9.50	12.00	16.00	18.50	28.50
No. 381, Flanged.....Each	9.50	11.50	15.00	19.00	22.00	32.00
End to End, Screwed.....Inches	4¼	4¾	5¼	5½	6	6¾
Face to Face, Flanged.....Inches	4¼	4¾	5¼	5½	6	6¾
Diameter Flanges.....Inches	6	7	7½	8½	9	10

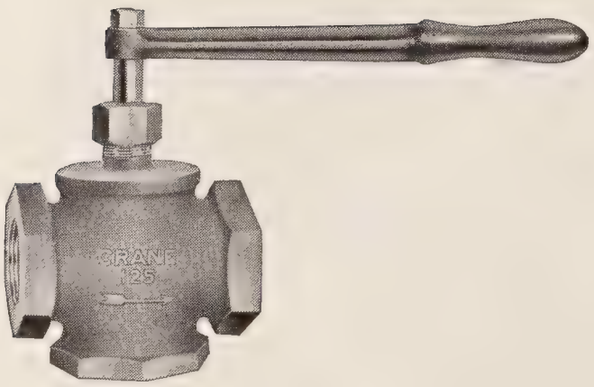
Size.....Inches	6	8	10	12	14	16
Size.....Millimeters	150	200	250	300	350	400
No. 380, Screwed.....Each	42.50					
No. 381, Flanged.....Each	47.00	90.00	125.00	160.00	275.00	350.00
End to End, Screwed.....Inches	7½					
Face to Face, Flanged.....Inches	7½	9¼	10¾	12½	14	16
Diameter Flanges.....Inches	11	13½	16	19	21	23½

Regularly made with steel stems; brass stem will be furnished at an extra price.
Templates for drilling, page 596. Price list for drilling, page 483.

QUICK ACTING

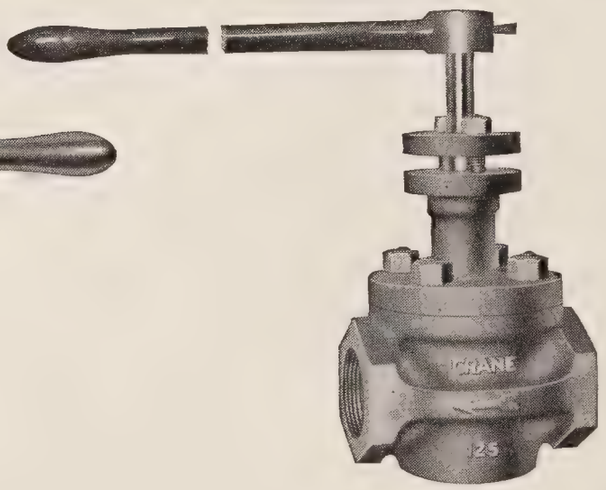
THROTTLE VALVES

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS



No. 46 BRASS

CODE: DESUMPTOS



No. 382 IRON BODY
BRASS MOUNTED

CODE: DESUNHANTE

No. 46—BRASS

Size.....Inches	¾	1	1¼	1½	2	2½
Size.....Millimeters	19	25	32	38	50	64
Price.....Each	10.00	11.50	14.00	20.00	25.00	35.00

No. 382—IRON BODY

Size.....Inches	2½	3	3½	4
Size.....Millimeters	64	76	90	100
Price, Screwed.....Each	30.00	40.00	50.00	60.00
End to End.....Inches	7⅛	8	8¾	9¾

These Throttle Valves are extensively used on hoisting and traction engines, are opened by one-quarter turn of handle and are provided with stops.

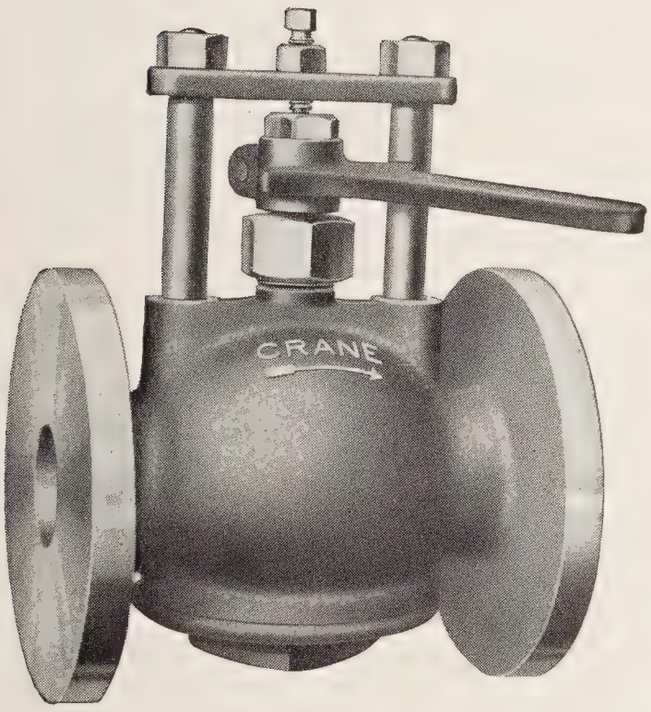
The No. 382 Valves can also be furnished with body and bonnet of cast steel for steam working pressures up to 250 pounds. Prices on application.

EXTRA HEAVY

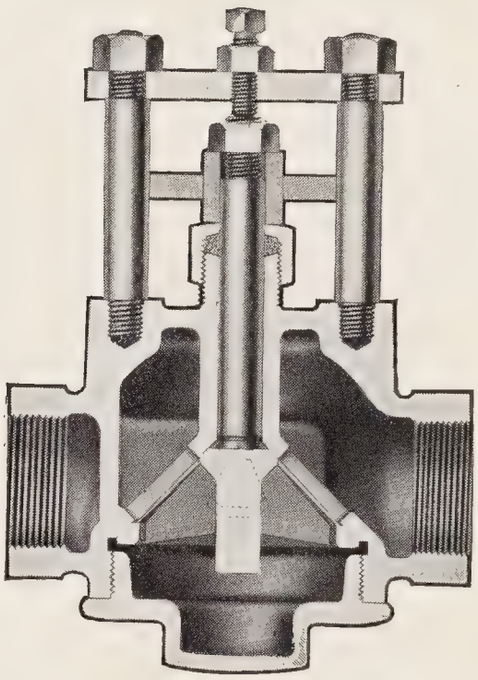
THROTTLE VALVES, CHRONOMETER TYPE

CROSSHEAD YOKE

FOR SATURATED STEAM WORKING PRESSURES UP TO 250 POUNDS



No. 4383, FLANGED
CODE: DESUSODITO



No. 4382, SCREWED
CODE: DESURGITIS

These valves open and close with one-eighth turn of the lever. The cap screw at the end of the stem is used to vary the pressure of the disc against its seat bearing so that "easy operation" can be obtained when desired.

With proper adjustment of the cap screw these valves can be operated by a float in a tank.

CONSTRUCTION

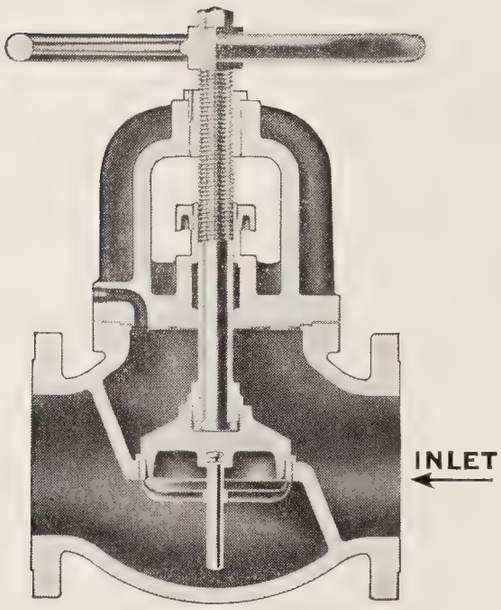
The body, disc and cap, sizes 2½ inches and smaller, are made of Crane Special Brass, Marine Composition. Sizes 3 inches and larger are made with Iron Body and Cap, and Crane Special Brass, Marine Composition Disc.

Sizes 1½ inches and smaller have screwed cap and screwed stuffing nut. Sizes 2 inches and larger have bolted cap and bolted gland.

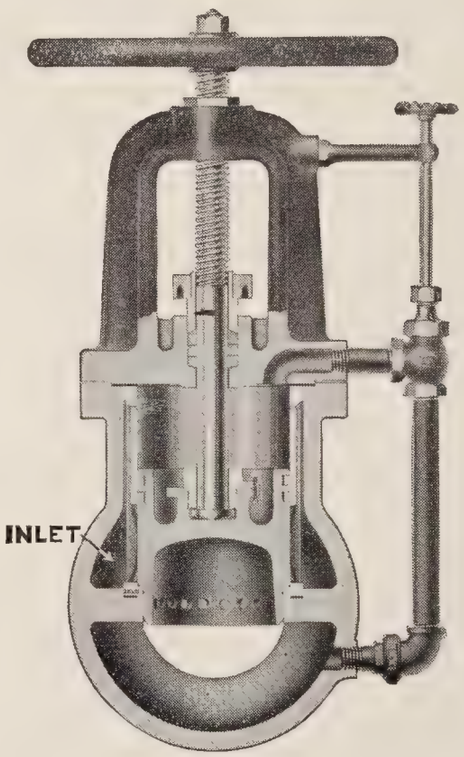
Prices and dimensions on application.

ENGINE THROTTLE VALVES

There are many designs of special Engine Throttle Valves made, and these are usually furnished by the engine builders. When we receive orders or inquiries for throttle valves, we supply valves as follows:



5 INCHES AND SMALLER



6 INCHES AND LARGER

These are made in Globe and Angle patterns, extra heavy, with flanged ends, in Ferrosteel, Brass Mounted, also in Cast Steel, Monel Mounted.

Sizes 5 inch and smaller are equipped with a throttling lip on the disc to allow the valve to be slightly opened, and reduces the likelihood of wire drawing at the seats when disc of the valve is in this position. The bonnet of the valve is equipped with a drain opening.

Sizes 6 inch and larger are of the Balanced type, to give ease in operating the valve and are equipped with an outside by-pass and readily renewable inside parts. The cushioned disc contains a deep throttling lip. The lip also has a number of drilled holes, so that limited quantities of steam may be admitted to the engine cylinders when starting up.

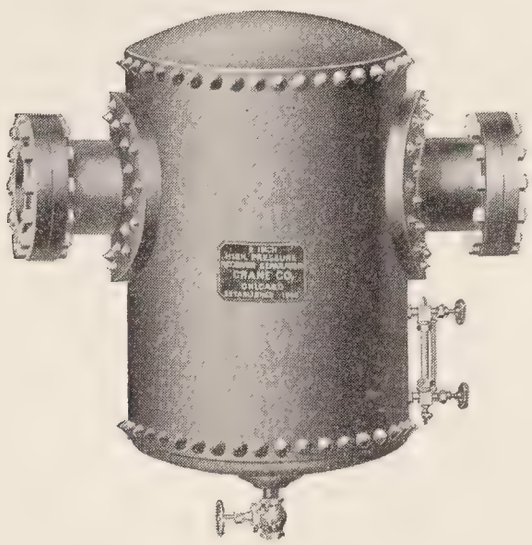
The stem and disc connection is of a special design, ruggedly made and locked to prevent the separation of the stem and the disc, which often occurs in throttle valves. The valve is also arranged for a drain connection.

PRICES ON APPLICATION

STEAM AND OIL SEPARATORS

CRANE PATENT

No. 03
LOW PRESSURE
OIL SEPARATOR



No. 014
RECEIVER STEAM
SEPARATOR

OIL SEPARATORS

FOR STEAM WORKING PRESSURES UP TO 25 POUNDS

STEAM SEPARATORS

RECEIVER STEAM SEPARATORS BUILT FOR ANY WORKING PRESSURE.

THESE SEPARATORS ARE EACH BUILT TO ORDER SO IT IS NECESSARY THAT WE HAVE COMPLETE INFORMATION WITH EACH INQUIRY, INFORMATION TO INCLUDE: WORKING PRESSURE AND SUPERHEAT, IF ANY.

With reference to illustrations on following pages: The design of these Separators is based upon the most approved and scientific principles.

Their construction covers all the desirable features and essential points that have suggested themselves during the course of our highly successful tests and their continued satisfactory performance.

We do not hesitate to offer this superior line of Separators in competition with any Steam or Oil Separating Devices on the market.

They have large areas and ample baffle surfaces, affording the highest degree of efficiency with the slightest loss in pressure.

HORIZONTAL SEPARATOR

It will be observed that the corrugations on the baffle plate do not run vertically but at an angle to the rising current of steam. This angle affords ready drainage and at the same time effectually prevents the steam from picking up any globules of water and carrying them over the top of baffle plate.

The steam on entering strikes the corrugated baffle plate and freeing itself from the entrained water, rises naturally over the top, where it sweeps around the curved walls of the head, is again deflected against the corrugated surface on the opposite side of the baffle, and then passes out to the engine in as dry condition as can be obtained through mechanical separation.

With the exception of the slight modification in the form of baffle plate in the larger sizes, this description applies equally as well to the efficiency of Separators in the elimination of oil and water from exhaust steam.

VERTICAL SEPARATOR

The same general ideas are carried out, the change in form necessitating, of course, a modification of the details in construction.

All Vertical Separators are the top inlet type. Vertical Separators with bottom inlet made to order. Prices on application.

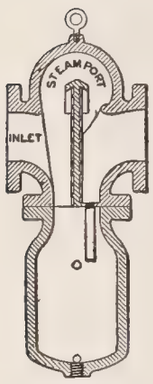
FOR SECTIONAL ILLUSTRATIONS, SEE PAGES 228 AND 229

ILLUSTRATING SECTIONAL VIEWS

OF THE VARIOUS TYPES OF

STEAM AND OIL SEPARATORS

PATENTED

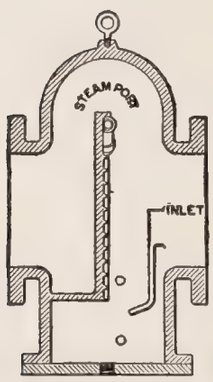


SIDE SECTION

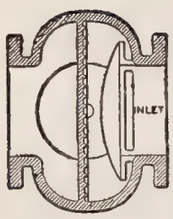
TOP SECTION

END SECTION

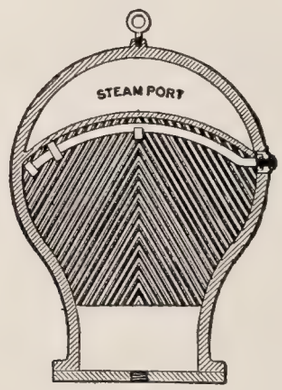
NOS. 01, 07, 011,



SIDE SECTION



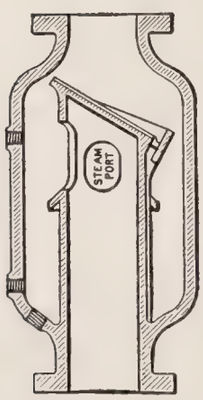
TOP SECTION



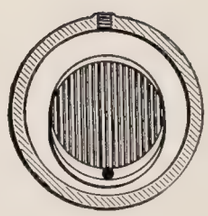
END SECTION

NO. 03

INLET

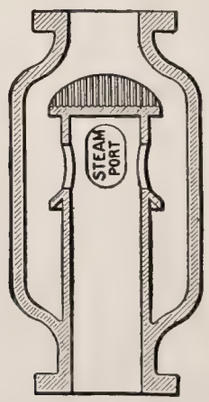


SIDE SECTION OF BAFFLE



TOP SECTION OF BAFFLE

INLET



END SECTION OF BAFFLE

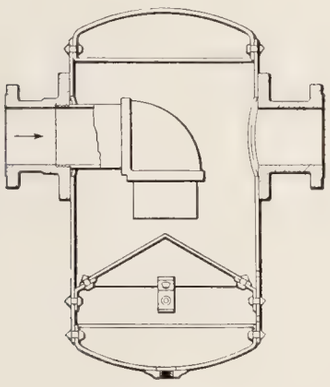
NOS. 05, 09, 013

RECEIVER STEAM SEPARATORS

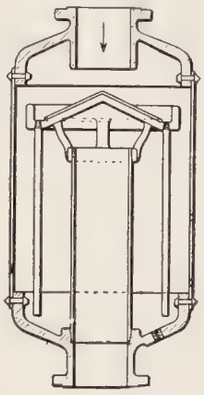
STEEL PLATE SHELL, FORGED OR CAST HEADS, DEPENDING UPON SIZE AND TYPE

(PATENTED)

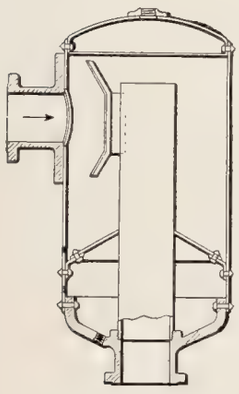
RECEIVER STEAM SEPARATORS BUILT FOR ANY WORKING PRESSURE
THESE SEPARATORS ARE EACH BUILT TO ORDER, SO IT IS NECESSARY THAT WE HAVE COMPLETE INFORMATION WITH EACH INQUIRY, INFORMATION TO INCLUDE: WORKING PRESSURE AND SUPERHEAT, IF ANY



No. 014
HORIZONTAL

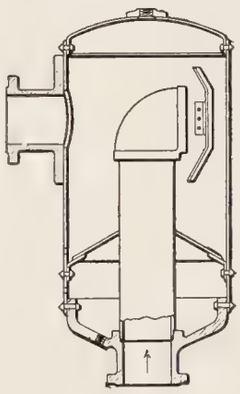


No. 017
TOP INLET
VERTICAL

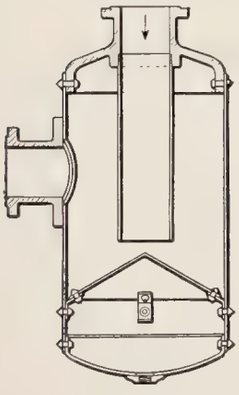


SIDE INLET

No. 019 ANGLE

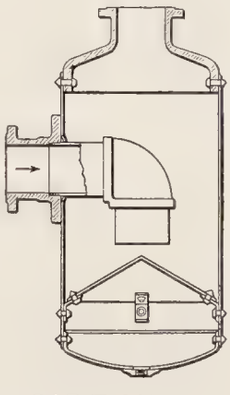


BOTTOM INLET



TOP INLET

No. 020 ANGLE



SIDE INLET

The advantages of our Combined Separators and Receivers will readily be appreciated.

Receiver Separators of suitable capacity, when placed close to the engine, act as a steam reservoir, and maintain a steady flow through the pipe, regardless of any sudden demand made by the engine, by reason of fluctuating loads, thereby preventing vibration and the possibility of serious damage resulting therefrom, by the shaking and jarring of building, walls and other parts of the plant.

In addition to furnishing dry steam to the engine, they also provide storage capacity in case of a sudden influx of water, which might be too great for the drainage system to take care of with the promptness such conditions would require.

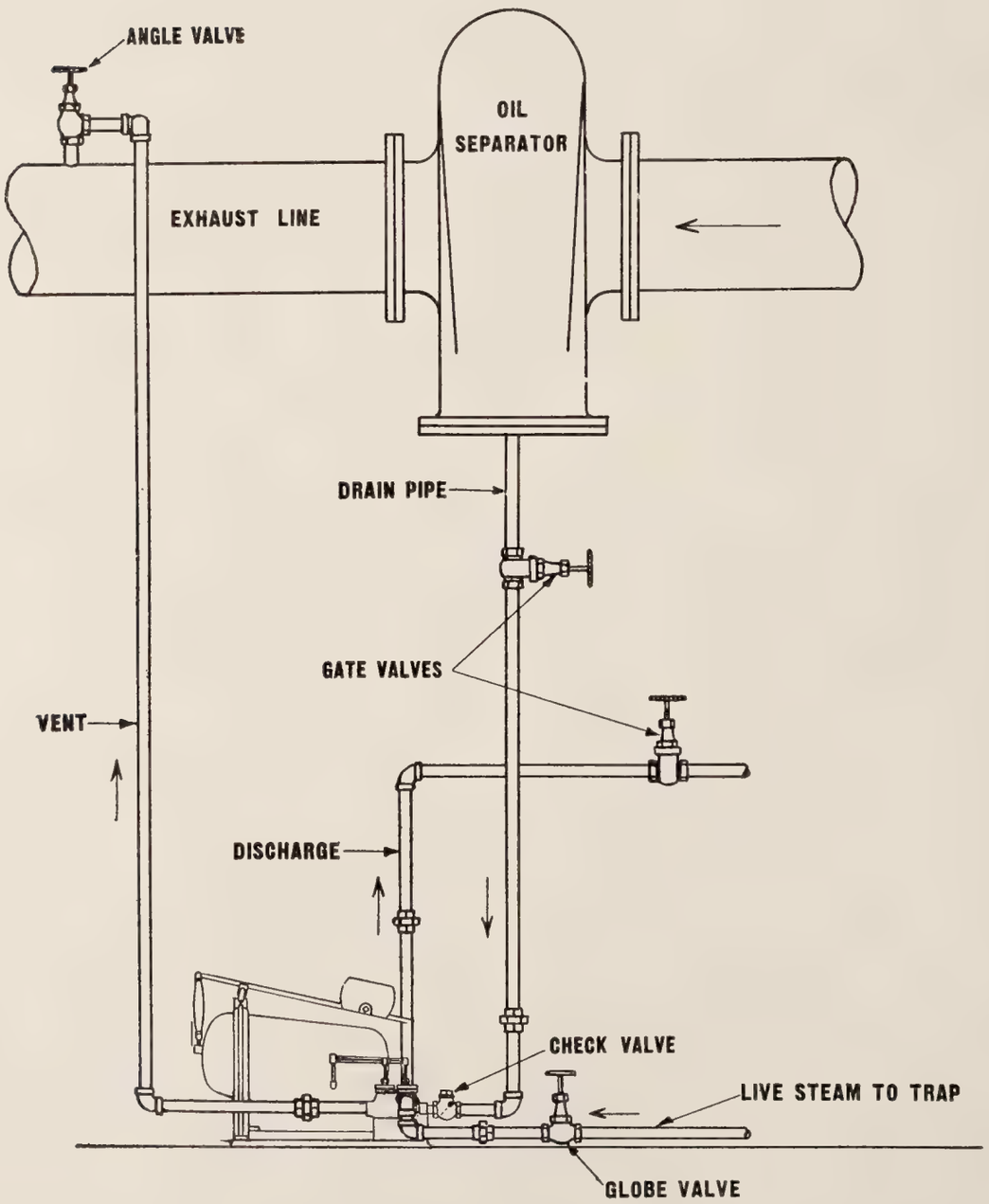
AUTOMATIC DRAINING SYSTEM

AS APPLIED TO

CRANE VACUUM OIL SEPARATORS

USING A

CRANETILT VACUUM TRAP



PRICES ON APPLICATION

All oil, steam and air separators to give best efficiency should be automatically drained. Every class of separator requires the correct trap for Automatic Drainage. Cranetilt Non-Return, Lifting and Vacuum Traps are particularly adapted to give the best service. Let us handle your separation and drainage problems.

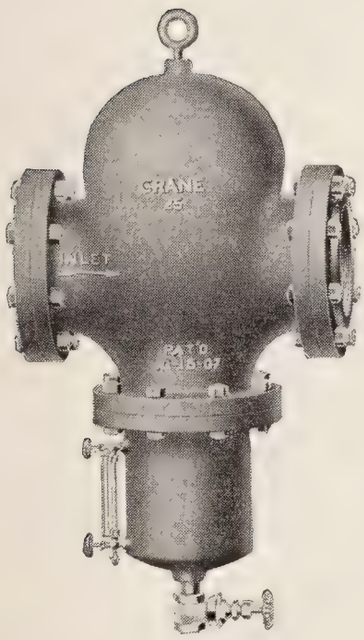
OIL SEPARATORS

CAST IRON

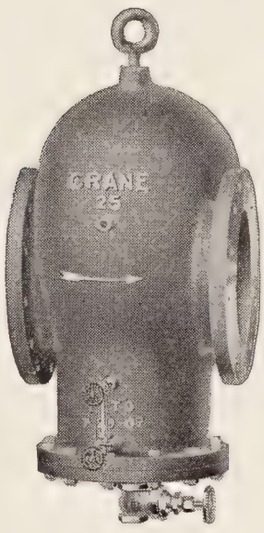
FOR THE ELIMINATION OF OIL AND WATER FROM EXHAUST STEAM AND VACUUM LINES

(PATENTED)

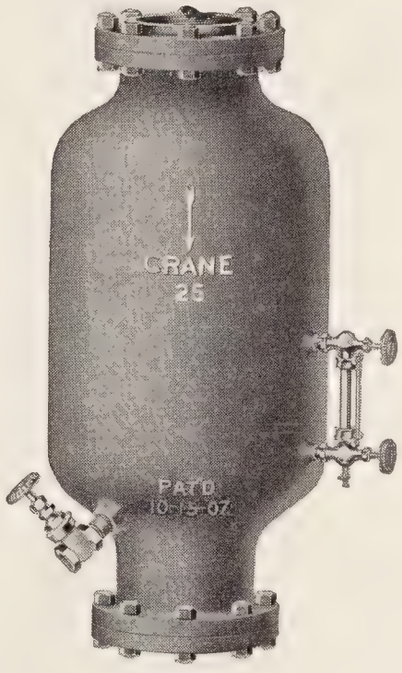
FOR STEAM WORKING PRESSURES UP TO 25 POUNDS



No. 01 HORIZONTAL
SIZES 10 INCH AND SMALLER
CODE: DESVASTIGA



No. 03 HORIZONTAL
SIZES 12 INCH AND LARGER
CODE: DESVENTAJA



No. 05 VERTICAL
TOP INLET
SIZES 1½ TO 12 INCH, INCLUSIVE
CODE: DESYUDGABA

Size.....Inches	1½	2	2½	3	3½	4	4½
Size.....Millimeters	38	50	64	76	90	100	113
Price, Horizontal or Vertical.....Each	24.00	28.00	34.00	42.00	50.00	58.00	68.00
Size.....Inches	5	6	7	8	9	10	12
Size.....Millimeters	125	150	175	200	225	250	300
Price, Horizontal or Vertical.....Each	76.00	98.00	116.00	134.00	152.00	170.00	200.00

Size.....Inches	14	16	18	20	22	
Size.....Millimeters	350	400	450	500	550	
Price, Horizontal only....Each	250.00	325.00	450.00	550.00	700.00	
Size.....Inches	24	26	28	30	36	
Size.....Millimeters	600	650	700	750	900	
Price, Horizontal only....Each	850.00	1000.00	1300.00	1600.00	2250.00	

MADE TO ORDER OF FERROSTEEL AT AN ADVANCE OF 25 PER CENT

The above prices include Water Gauge, Drain Valve and Nipple, Companion Flanges bolted on, but no Gaskets on the No. 01 and the No. 05 Separators.

With the No. 03 Separators we furnish Water Gauge, Drain Valve and Nipple and drill the Flanges, but do not furnish Companion Flanges and Bolts, except with the 12-inch size, as the larger Separators are usually bolted to some exhaust outlet or to piping which already has Flanges on it.

The Flange on bottom of the No. 03 Separator may be removed, and the Baffle Plate examined and thoroughly cleaned by hand, if necessary.

For general dimensions, see page 635.
Templates for drilling, page 596.
For further description and sectional illustrations, see pages 227 and 228.

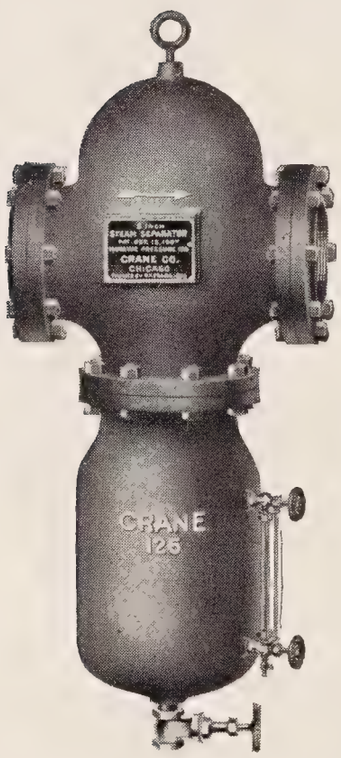
STANDARD

STEAM SEPARATORS

PATENTED

CAST IRON

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS



No. 07 HORIZONTAL

CODE: DETALINGAR

No. 09 VERTICAL
TOP INLET

CODE: DETESTAMMO

Size.....Inches	1½	2	2½	3	3½	4	4½
Size.....Millimeters	38	50	64	76	90	100	113
No. 07 and No. 09.....Each	24.00	28.00	34.00	42.00	50.00	58.00	68.00
Size.....Inches	5	6	7	8	9	10	12
Size.....Millimeters	125	150	175	200	225	250	300
No. 07 and No. 09.....Each	76.00	98.00	116.00	134.00	152.00	170.00	200.00

MADE TO ORDER OF FERROSTEEL AT AN ADVANCE OF 25 PER CENT

We will furnish 1 and 1¼-inch Separators made from same patterns and at same price as 1½-inch size.

The above prices include Water Gauge, Drain Valve and Nipple, also Companion Flanges and Bolts, but no Gaskets.

For general dimensions, see page 636.

Templates for drilling, page 596.

For further description and sectional illustrations, see pages 227 and 228.

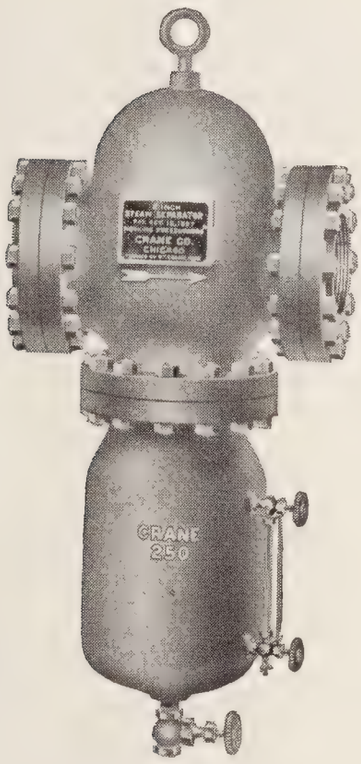
EXTRA HEAVY

STEAM SEPARATORS

FERROSTEEL

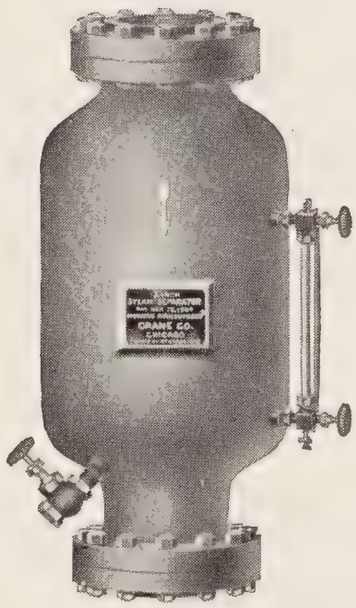
FOR SATURATED STEAM WORKING PRESSURES UP TO 250 POUNDS

FOR SUPERHEATED STEAM WORKING PRESSURES UP TO 250 POUNDS AND A TOTAL TEMPERATURE NOT TO EXCEED 500 DEGREES FAHR.



No. 011 HORIZONTAL

CODE: DETONDENTO



No. 013 VERTICAL

TOP INLET

CODE: DETORASSEM

Size.....Inches	1½	2	2½	3	3½	4	4½
Size.....Millimeters	38	50	64	76	90	100	113
No. 011 and No. 013.....Each	26.50	31.00	37.50	46.00	55.00	64.00	75.00
Size.....Inches	5	6	7	8	9	10	12
Size.....Millimeters	125	150	175	200	225	250	300
No. 011 and No. 013.....Each	84.00	108.00	128.00	147.00	187.00	187.00	220.00

We will furnish 1 and 1¼-inch Separators made from same patterns and at same price as 1½-inch size.

The above prices include Water Gauge, Drain Valve and Nipple, also Companion Flanges and Bolts, but no Gaskets.

For general dimensions, see page 637.

Templates for drilling, page 598.

For further description and sectional illustrations, see pages 227 and 228.

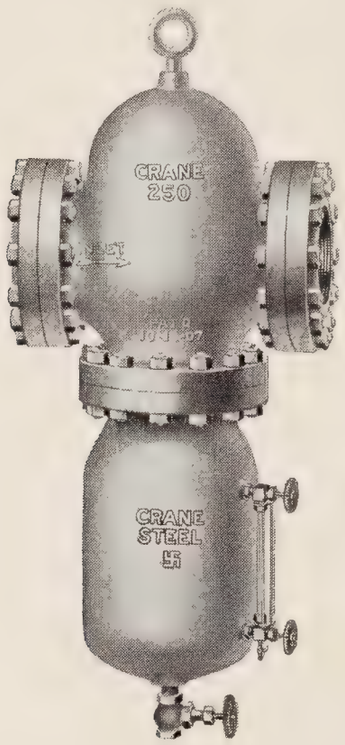
CAST STEEL

STEAM SEPARATORS

FOR SUPERHEATED STEAM WORKING PRESSURES UP TO 350 POUNDS AND A TOTAL TEMPERATURE OF 800 DEGREES FAHRENHEIT

STEEL BOLTS OF HIGH TENSILE STRENGTH or commercial bolts larger in diameter must be used on the end flanges when separators are subjected to steam working pressures in excess of 300 pounds.

A. S. M. E. EXTRA HEAVY BOLTING using commercial bolts is not strong enough for steam working pressures in excess of 300 pounds.



No. 011 STEEL
HORIZONTAL

CODE: DETOUPAMES

No. 013 STEEL
VERTICAL
TOP INLET
CODE: DETRAHISSE

Size.....Inches	1½	2	2½	3	3½	4	4½
Size.....Millimeters	38	50	64	76	90	100	113
No. 011 S, or No. 013 S, Each	70.00	75.00	80.00	90.00	105.00	115.00	130.00
Size.....Inches	5	6	7	8	9	10	12
Size.....Millimeters	125	150	175	200	225	250	300
No. 011 S, or No. 013 S, Each	140.00	175.00	200.00	250.00	375.00	400.00	500.00

We will furnish 1 and 1¼ inch Separators made from same patterns and at same price as 1½ inch size.

The above prices include Water Gauge, Drain Valve and Nipple, also Companion Flanges and Bolts, but no Gaskets.

For general dimensions, see page 637.

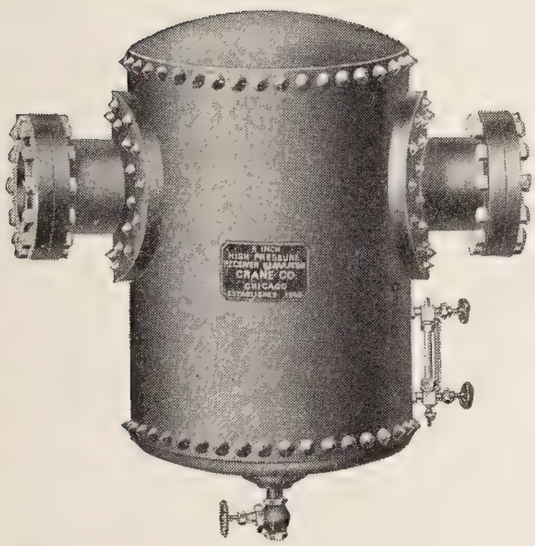
Templates for drilling see page 598.

For further description and sectional illustrations, see pages 227 and 228.

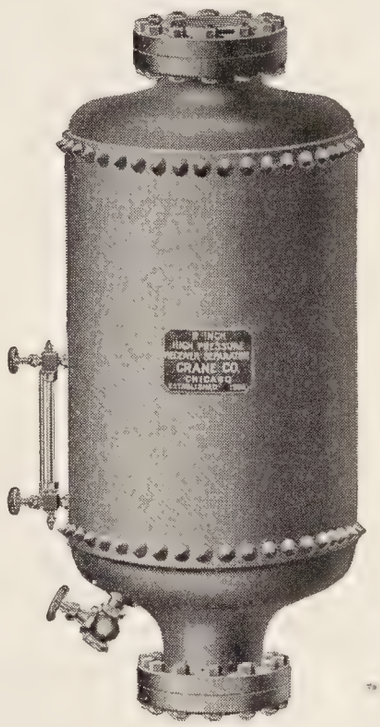
Furnished with 1/16 inch raised face. For diameters, see page 665.

RECEIVER STEAM SEPARATORS

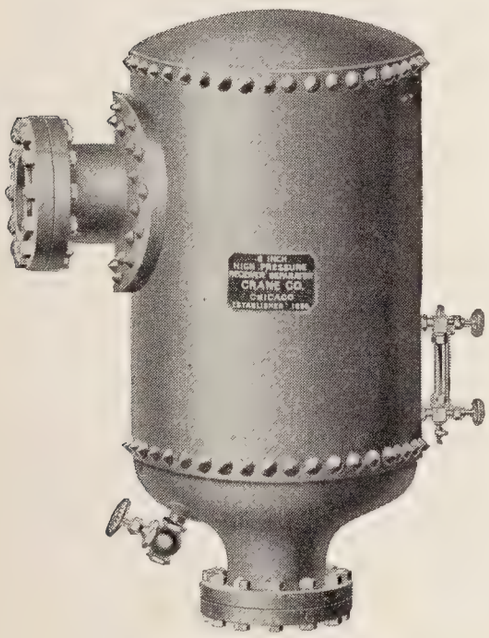
RECEIVER STEAM SEPARATORS ARE BUILT FOR ANY WORKING PRESSURE. THESE SEPARATORS ARE EACH BUILT TO ORDER SO IT IS NECESSARY THAT WE HAVE COMPLETE INFORMATION WITH EACH INQUIRY, INFORMATION TO INCLUDE WORKING PRESSURE AND SUPERHEAT IF ANY



No. 014
HORIZONTAL
SIZES 4 TO 20 INCH, INCLUSIVE
CODE: DETRUDEVA

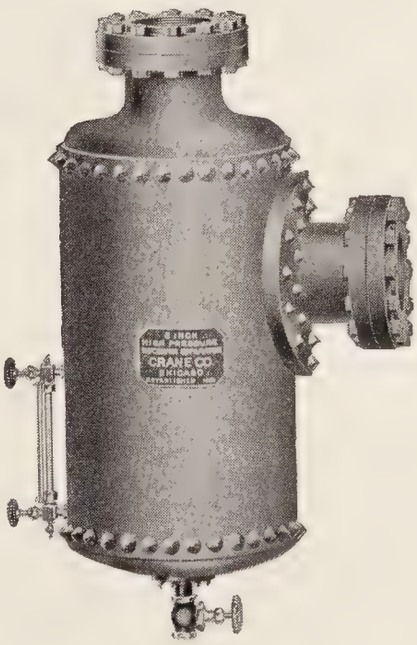


No. 017
VERTICAL
SIZES 4 TO 20 INCH, INCLUSIVE
CODE: DETRUNCABO



No. 019
CODE: DETTAMENTO

ANGLE
SIZES 4 TO 20 INCH, INCLUSIVE



No. 020
CODE: DETUNDITOR

CONSTRUCTED WITH STEEL PLATE SHELL, FORGED OR CAST HEADS DEPENDING UPON SIZE AND TYPE

No. 017, sizes 6 inch and smaller are made entirely of Ferrosteel.

THEY CAN BE CONSTRUCTED SO THAT STEAM MAY ENTER AT TOP, BOTTOM OR SIDE

INQUIRIES SHOULD STATE DIRECTION OF FLOW

PRICES ON APPLICATION

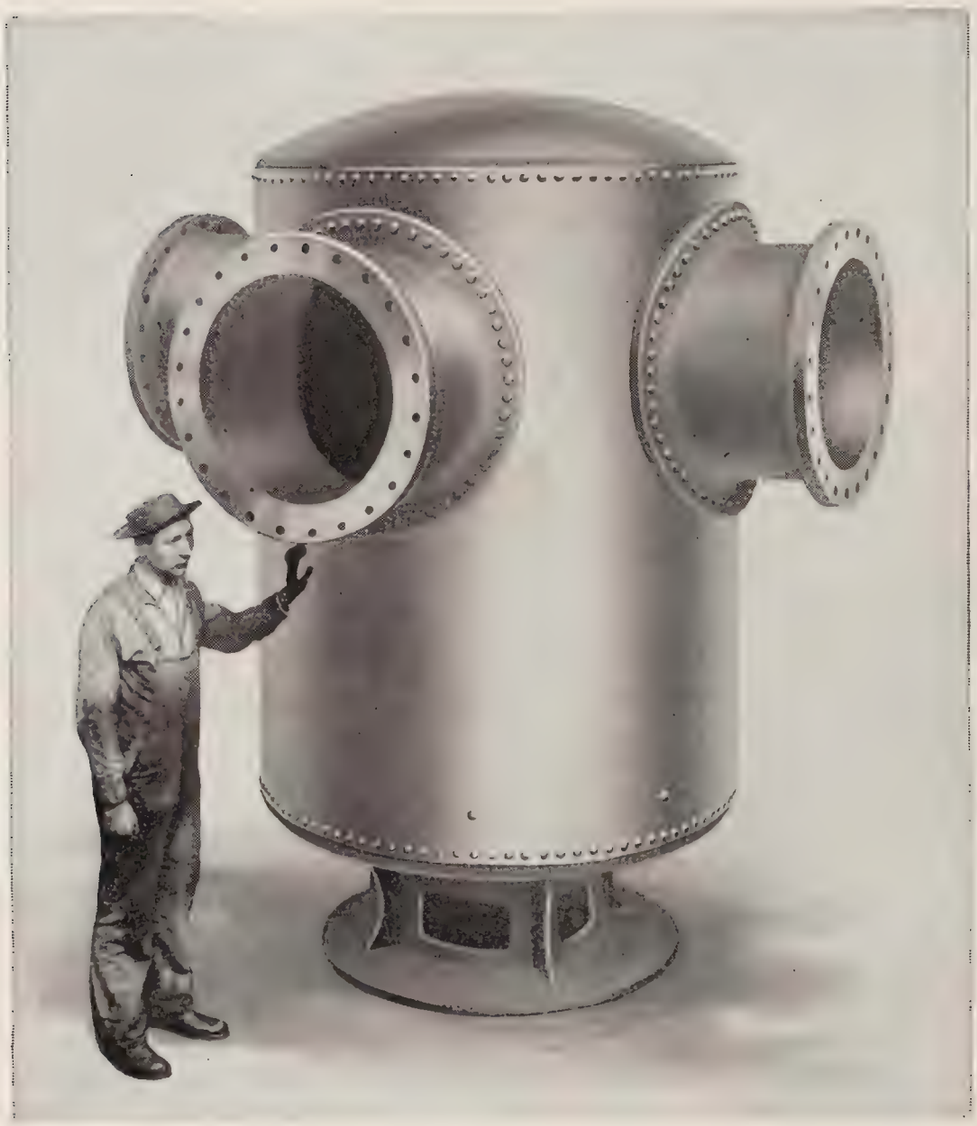
General dimensions, furnished on request.
Templates for drilling, page 598.
For further description and sectional illustrations, see pages 227 and 229.

DISTRIBUTING

RECEIVER STEAM SEPARATOR

Receiver Steam Separators built for any working pressure. These Separators are each built to order so it is necessary that we have complete information with each inquiry; information to include

Working Pressure,
Superheat, if any,
Sizes and location of nozzles, etc.



No. 021

These combined Receivers and Steam Separators can be furnished to conform to various designs and specifications. The above cut is intended merely to give a general idea of construction.

They can be constructed so that steam will enter from the side or top, and outlets may be taken from any desired point in the upper section.

WHEN ORDERING OR REQUESTING PRICES, SUBMIT DRAWINGS

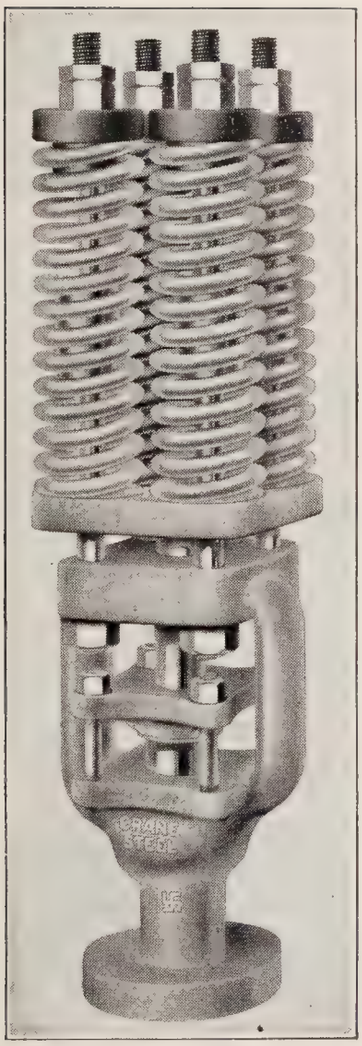
MADE IN SIZES 10 INCH AND LARGER

PRICES ON APPLICATION

HYDRAULIC

CAST STEEL SHOCK ABSORBERS

FOR COLD WATER OR OIL WORKING PRESSURES UP TO 3000 POUNDS



No. 3043-H

CODE: DEUGDELIJK

Size.....Inches	1½	2	3	4
Size.....Millimeters	38	50	76	100
Diameter of Piston.....Inches	1½	1½	2½	3

Prices on application.

When ordering or requesting prices, specify size and normal working pressure.

In hydraulic systems having quick closing Valves, the shock on the piping due to sudden stoppage of flow is sometimes very severe, and unless provision is made to cushion the shock, there is danger of rupture in the piping.

These Shock Absorbers consist of a piston loaded with springs which are compressed sufficiently to balance the normal pressure in the line.

Over-pressure due to shock causes further compression which provides a cushion and prevents undue strains on the piping.

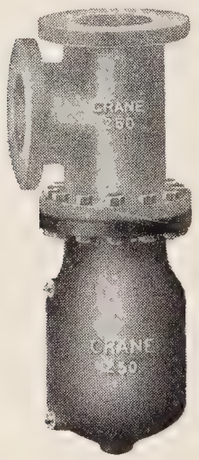
The springs are long and liberally proportioned, to provide ample flexibility.

Unless otherwise specified, Shock Absorbers are furnished Flanged with male face.

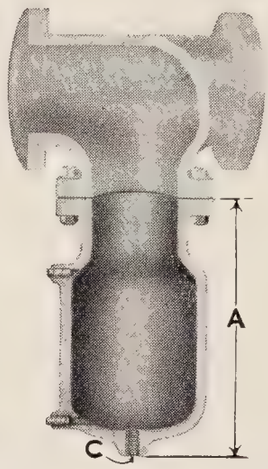
CAST IRON DRIP POCKETS FOR STEAM MAINS

STANDARD: FOR STEAM WORKING PRESSURES UP TO 125 POUNDS
EXTRA HEAVY: FOR SATURATED STEAM WORKING PRESSURES UP TO 250 POUNDS

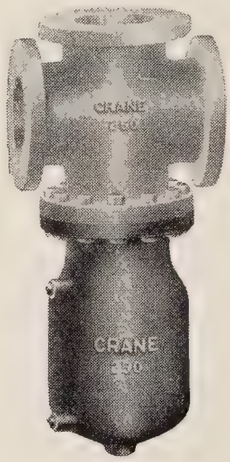
STANDARD—CODE: DEUNTJES **EXTRA HEAVY—CODE: DEUTERONOM**



FOR VERTICAL PIPE



FOR HORIZONTAL PIPE



FOR HORIZONTAL AND VERTICAL PIPE

Size Inches	Size Millimeters	Price List				Dimensions	
		Standard		Extra Heavy			
		With Faced Flanges Each	With Faced and Drilled Flanges Each	With Faced Flanges Each	With Faced and Drilled Flanges Each	A Height of Drip Pocket Inches	C Size of Drain Connection Inches
2½	64	19.00	20.00	19.00	20.00	13	¾
3	76	21.00	22.00	21.00	22.00	14	1
3½	90	23.00	24.00	23.00	24.00	16	1
4	100	24.00	26.00	24.00	26.00	16	1
4½	113	26.00	28.00	26.00	28.00	18	1¼
5	125	28.00	30.00	28.00	30.00	18	1¼
6	150	35.00	37.00	35.00	37.00	20	1¼
7	175	47.00	50.00	47.00	50.00	24¼	1¼
8	200	52.00	55.00	52.00	55.00	24¼	1¼
9	225	72.00	75.00	72.00	75.00	28	1½
10	250	77.00	80.00	77.00	80.00	28	1½
12	300	115.00	120.00	115.00	120.00	32	1½

DIFFERENT DISCOUNTS APPLY TO THE ABOVE LIST PRICES OF STANDARD AND EXTRA HEAVY DRIP POCKETS.

EXTRA HEAVY DRIP POCKETS FURNISHED TO ORDER OF FERROSTEEL AT AN ADVANCE OF 25 PER CENT. FOR SUPERHEATED STEAM RATING OF FERROSTEEL SEE PAGE 435.

These attachments not only serve as drainage collectors, but also aid in keeping the piping clear of pipe scale, dirt and other foreign matter that might otherwise accumulate and cause trouble.

Excepting on pipe lines larger than 12-inch, we recommend using FULL SIZE DRIP POCKETS, corresponding to the size pipe to which they are connected, thus avoiding any possibility of water being carried beyond them, as very likely would happen by using reduced openings or smaller size pockets.

The 12-inch Drip Pocket is large enough to take care of the condensation in steam lines from 14 to 24 inches, inclusive. In using this Drip Pocket on larger sizes than 12-inch, it will be necessary to use a reducing fitting to conform to the 12 x 19 or 12 x 20½ flange on the Drip Pocket.

Drip Pockets will be furnished faced only, unless otherwise ordered.

Prices do not include the flanged fittings or bolts shown in above illustrations.

Drip Pockets will be tapped for water gauge. Water Gauge will be furnished when ordered, at an extra price.

Diameter of Flanges and Templates for drilling: for Standard, see page 596; for Extra Heavy, see page 598.

CAST STEEL

DRIP POCKETS FOR STEAM MAINS

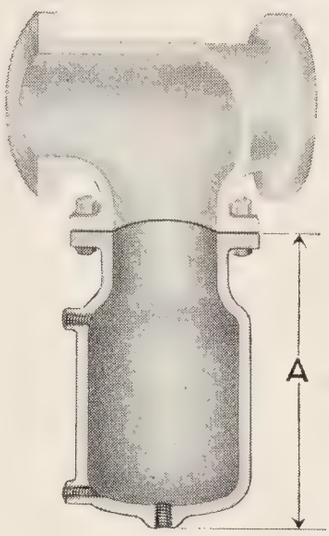
CODE: DEVAGEMUR

FOR SUPERHEATED STEAM UP TO 350 POUNDS WORKING PRESSURE AND A TOTAL TEMPERATURE OF 800 DEGREES FAHRENHEIT

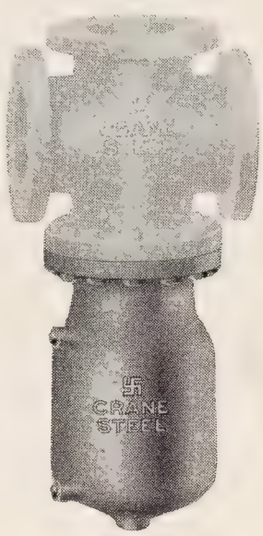
STEEL BOLTS OF HIGH TENSILE STRENGTH or commercial bolts larger in diameter must be used on the end flanges when these fittings are subjected to steam working pressures in excess of 300 pounds.

A. S. M. E. EXTRA HEAVY BOLTING using commercial bolts is not strong enough for steam working pressures in excess of 300 pounds.

FOR VERTICAL PIPE



FOR HORIZONTAL PIPE



FOR HORIZONTAL AND VERTICAL PIPE

Size	Size	Price List		Dimensions	
Inches	Millimeters	With Faced Flanges Each	With Faced and Drilled Flanges Each	A Height of Drip Pocket Inches	Size of Drain Connection Inches
2½	64	18.00	20.00	13	¾
3	76	20.00	23.00	14	1
3½	90	23.00	26.00	16	1
4	100	26.00	29.00	16	1
4½	113	31.00	34.00	18	1¼
5	125	34.00	37.00	18	1¼
6	150	42.00	46.00	20	1¼
7	175	51.00	56.00	24¼	1¼
8	200	60.00	65.00	24¼	1¼
9	225	71.00	76.00	28	1½
10	250	84.00	90.00	28	1½
12	300	103.00	110.00	32	1½

These Attachments not only serve as drainage collectors, but also keep the piping clear of pipe scale, dirt and other foreign matter that would otherwise accumulate and cause trouble in new installation work.

Excepting sizes above 12 inch, we always recommend using FULL SIZE DRIP POCKETS, corresponding to the size pipe to which they are connected, thus avoiding any possibility of water being carried beyond them, as would very likely happen by using reduced openings or smaller size Pockets.

The 12 inch Drip Pocket is large enough to take care of the condensation in steam lines from 14 to 24 inch, inclusive. In using this Drip Pocket on larger sizes than 12 inch, it will be necessary to use a reducing fitting to conform to the 12×20½ flange on the Drip Pocket. Drip Pockets will be furnished faced only, unless otherwise ordered.

Prices do not include the flanged fittings or bolts shown in above illustrations.

Drip Pockets will be tapped for water gauge. Water Gauge will be furnished when ordered, at an extra price.

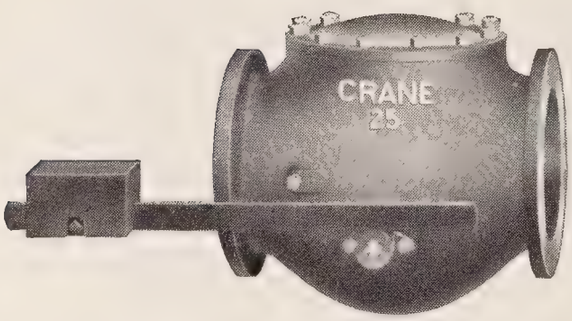
Diameter of Flanges and Templates for drilling, page 598.

Furnished with $\frac{1}{16}$ raised face, for diameters see page 665.

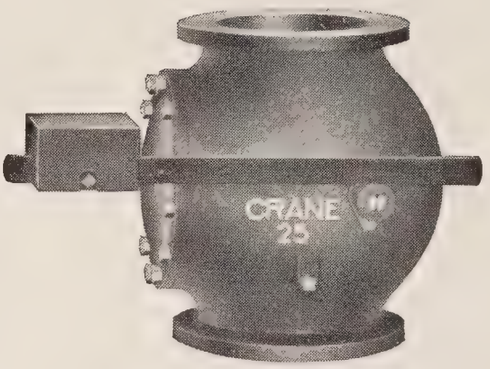
BACK PRESSURE VALVES

IRON BODY BRASS TRIMMINGS

WEIGHTED FOR BACK PRESSURE UP TO 5 POUNDS



HORIZONTAL
4" AND LARGER



VERTICAL
ALL SIZES

No. 384 SCREWED

CODE: DEVECTABAM

Size	Inches	2	2½	3	3½	4
Size	Millimeters	50	64	76	90	100
Price	Each	11.00	13.00	15.00	19.00	22.50
Size	Inches	5	6	7	8	
Size	Millimeters	125	150	175	200	
Price	Each	33.50	43.00	70.00	85.00	

No. 385 FLANGED

CODE: DEVEHENTEM

Size	Inches	5	6	7	8	10	12
Size	Millimeters	125	150	175	200	250	300
Price	Each	37.00	47.00	75.00	90.00	130.00	200.00
Face to Face	Inches	13	14	16	19½	24½	27½
Diameter of Flanges	Inches	10	11	12½	13½	16	19

Can be placed in either horizontal or vertical position by changing the position of lever and weight.

Combination Back Pressure and Exhaust Relief Valves, pages 242 and 243.

For valves to be used to relieve Back Pressures above 5 pounds see pages 244 and 245.

Templates for drilling, page 596. Price List for drilling, page 483.

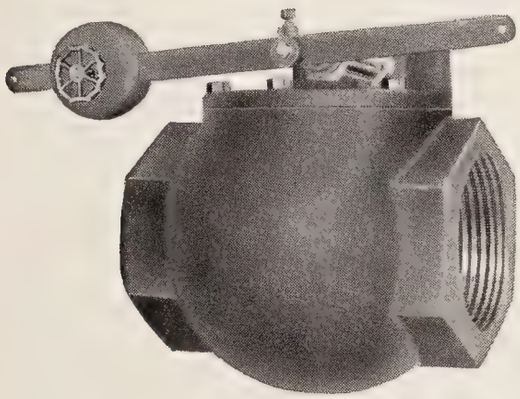
NOISELESS

BACK PRESSURE VALVES

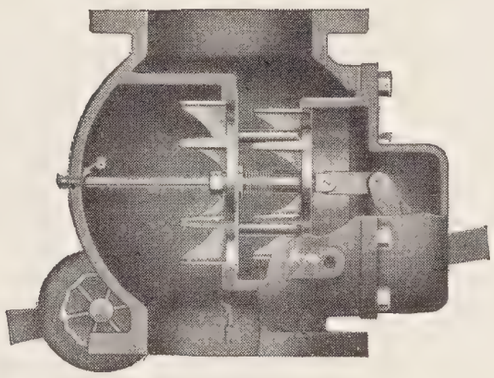
FOR NON-CONDENSING ENGINES ONLY

DOUBLE DISC
IRON BODY

PISTON TYPE
BRASS TRIMMINGS



HORIZONTAL



VERTICAL

CAN BE PLACED IN EITHER HORIZONTAL OR VERTICAL POSITION BY CHANGING THE POSITION OF LEVER AND WEIGHT

No. 416. SCREWED

CODE: DEVIBRATE

Size.....Inches	2	2½	3	3½	4	4½	5	6	7	8	9
Size.....Millimeters	50	64	76	90	100	113	125	150	175	200	225
Price.....Each	37.50	45.00	52.50	60.00	67.50	75.00	90.00	127.50	155.00	200.00	245.00
End to End.....Inches	6⅝	7⅞	9	9¾	10⅝	11¼	12⅛	13⅛	14½	16⅛	17¾

No. 417. FLANGED

CODE: DEVINAILLE

Size.....Inches	2	2½	3	3½	4	4½	5
Size.....Millimeters	50	64	76	90	100	113	125
Price.....Each	45.00	52.50	60.00	67.50	75.00	82.50	97.50
Diameter of Flanges.....Inches	6	7	7½	8½	9	9¼	10
Face to Face.....Inches	7⅝	9	9⅝	10⅝	11¼	12¾	13⅛

Size.....Inches	6	7	8	9	10	12	14
Size.....Millimeters	150	175	200	225	250	300	350
Price.....Each	135.00	165.00	210.00	255.00	270.00	330.00	517.50
Diameter of Flanges.....Inches	11	12½	13½	15	16	19	21
Face to Face.....Inches	14⅛	15½	16½	18⅞	20⅛	24¼	26⅜

Size.....Inches	15	16	18	20	22	24	
Size.....Millimeters	375	400	450	500	550	600	
Price.....Each	600.00	697.50	900.00	1125.00	1350.00	1575.00	
Diameter of Flanges.....Inches	22¼	23½	25	27½	29½	32	
Face to Face.....Inches	26⅜	28⅛	31¼	33¼	44¾	44¾	

These Valves have one disc equal to the full area of the pipe and are also provided with a balancing disc to eliminate excessive weighting. Standard Valves are intended for a working pressure range limit as follows. Other pressure ranges made to order at an additional price:

Sizes	Vertical	Horizontal
2 and 2½ inch	Pressure Range 4 to 20 lbs.	1 to 20 lbs.
3 to 5 inch	Pressure Range 3 to 10 lbs.	1 to 10 lbs.
6 to 9 inch	Pressure Range 2 to 6 lbs.	2 to 6 lbs.
10 to 12 inch	Pressure Range 2 to 4 lbs.	2 to 6 lbs.
14 to 24 inch	Pressure Range 2 to 4 lbs.	3 to 6 lbs.

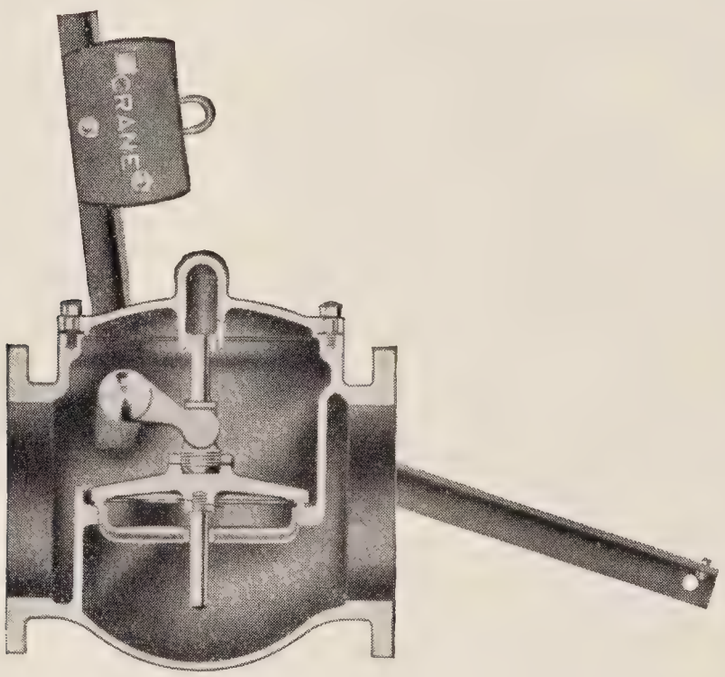
The above Flanged Valves are shipped Faced and Drilled, standard at no extra charge.
Templates for drilling, page 596.

COMBINATION

BACK PRESSURE AND EXHAUST RELIEF VALVES

FOR CONDENSING OR NON-CONDENSING ENGINES

IRON BODY BRASS MOUNTED



No. 415 H HORIZONTAL

GENERAL

These Valves are provided with dashpots to cushion the discs and prevent pounding or hammering and are so constructed that foreign matter can not collect and interfere with their operation.

The lever weights are arranged so that the Valves may be used as ATMOSPHERIC EXHAUST RELIEF VALVES for condensing engines or as BACK PRESSURE VALVES for non-condensing engines.

Sizes 16-inch and larger have double levers and weights.

EXHAUST RELIEF VALVES FOR CONDENSING ENGINES

When used as ATMOSPHERIC EXHAUST RELIEF VALVES for condensing engines, they remain closed while the vacuum is maintained in the condenser, but should the vacuum be lost, the Valves will open automatically by reason of the pressure of the exhaust steam lifting the disc, permitting the engine to exhaust freely into the atmosphere and STAY OPEN UNTIL CLOSED BY HAND when the weight is located on the angle arm of the outside levers, as shown in illustration above.

Means are provided for water sealing the Valve seat.

BACK PRESSURE VALVES FOR NON-CONDENSING ENGINES

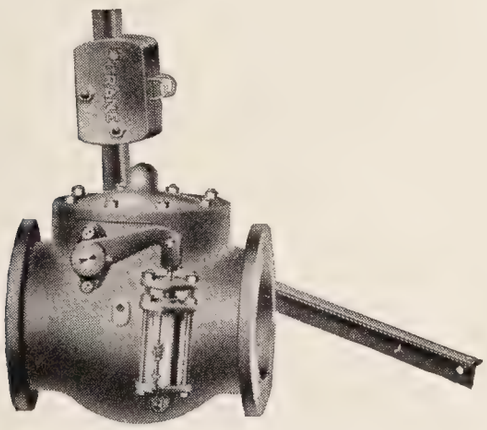
When arranged as BACK PRESSURE VALVES for use with non-condensing engines, the weight is bolted to the horizontal arm of the lever. They may be weighted for a maximum Back Pressure of five pounds.

These Valves are also recommended for use on Vacuum Heating Systems.

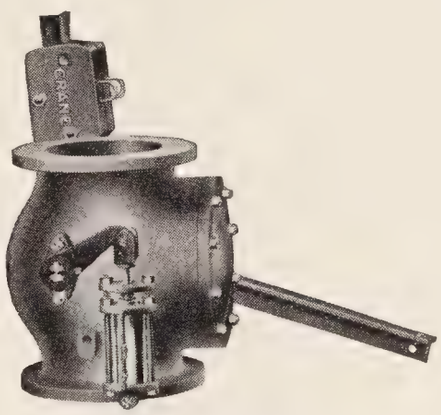
An Exhaust Relief Valve will handle steam in varying quantities, but when a very small volume of steam is to be exhausted to atmosphere continuously, a small valve should be used, as too large a valve will have a tendency to chatter. Where a large volume of exhaust steam is to be discharged in the summer only and a very small volume in the winter, we recommend the use of two valves; a large one set at a slightly higher pressure and the small one set at a lower pressure.

COMBINATION
BACK PRESSURE AND EXHAUST RELIEF VALVES
STAY OPEN TYPE
FOR CONDENSING OR NON-CONDENSING ENGINES
PATENTED

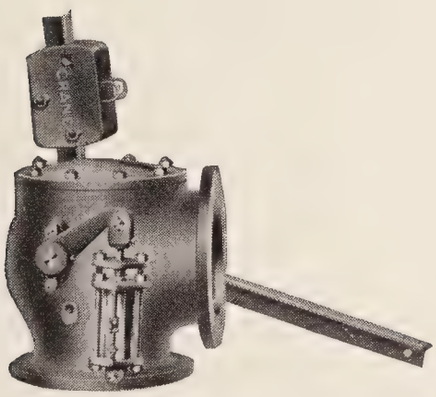
IRON BODY — BRASS MOUNTED



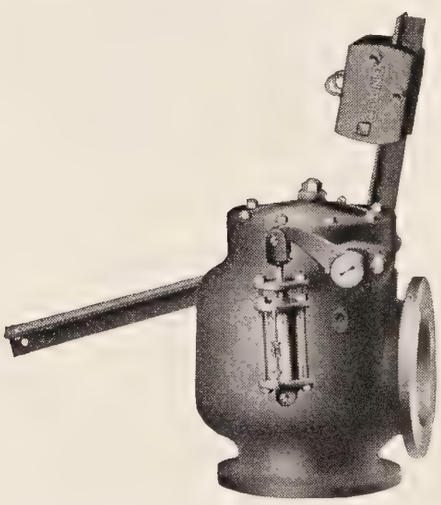
No. 415 H HORIZONTAL
CODE: DEVOLVIDO



No. 415 V VERTICAL
CODE: DEVORSOR



No. 415 A ANGLE
CODE: DEVOVISSEM



SPECIAL DOWN DISCHARGE
CODE: DIABLINTOS

PRICE LIST OF
HORIZONTAL, VERTICAL AND ANGLE VALVES
No. 415 FLANGED

Size.....Inches	4	5	6	7	8	10	12	14
Size...Millimeters	100	125	150	175	200	250	300	350
No. 415H....Each	64.00	88.00	120.00	175.00	195.00	310.00	385.00	475.00
No. 415V.....Each	64.00	88.00	120.00	175.00	195.00	310.00	385.00	475.00
No. 415A.....Each	64.00	88.00	120.00	175.00	195.00	310.00	385.00	475.00

Size.....Inches	16	18	20	22*	24*	30*	36*	
Size...Milimeters	400	450	500	550	600	750	900	
No. 415H....Each	575.00	675.00	775.00	1050.00	1350.00	2100.00	3000.00	
No. 415V.....Each	575.00	675.00	775.00					
No. 415A.....Each	575.00	675.00	775.00					

*Furnished in horizontal pattern only.

The above prices do not apply to the Special Down Discharge Valves, which are made to order only in sizes 12 inches and larger, at a special price.

Sizes 16 inch and larger have double levers.

For general dimensions, see page 628.

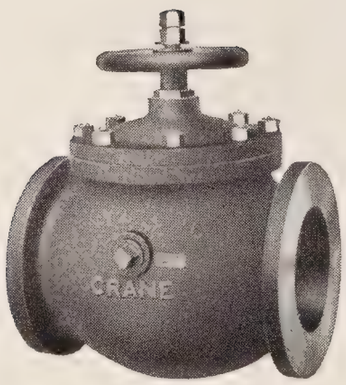
For drilling templates, see page 596. Price List for drilling, page 483.

BACK PRESSURE AND EXHAUST RELIEF VALVES

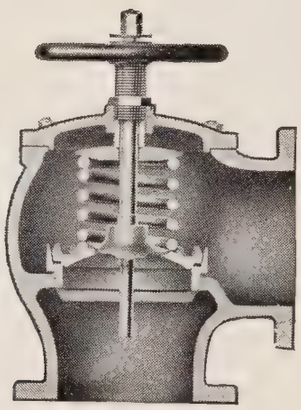
FOR BACK PRESSURES HIGHER THAN USUALLY USED.

SPRING LOADED TYPE

IRON BODY HORIZONTAL AND ANGLE BRASS SEAT AND DISC



No. 386 H. HORIZONTAL
CODE: DIACALPE



No. 386 A. ANGLE
CODE: DIACLASITE

Size ..... Inches	2½	3	3½	4	4½	5	6	7	8	10	12
Size ..... Millimeters	64	76	90	100	113	125	150	175	200	250	300
No. 386-H, Horizontal ..... Each	Prices on application.										
No. 386-A, Angle ..... Each	Prices on application.										

These valves are intended for service on exhaust lines between the engine and the atmosphere, where a considerable amount of back pressure is desired, and as Relief Valves on large low pressure vessels, such as condensers, etc. They can be set to relieve at any pressure specified from 3 to 20 pounds when relieving to the atmosphere.

These valves have adjustable popping chambers to give them a more positive opening and closing than ordinarily found in Back Pressure Valves. They also have greater discharging capacity than ordinarily found in weight-loaded Back Pressure Valves.

To adjust for different pressures: Turn hand wheel to the right to increase the pressure and turn to the left to decrease the pressure. After all tension has been taken off the spring, the valve can be opened by means of the hand wheel and kept in an open position permanently.

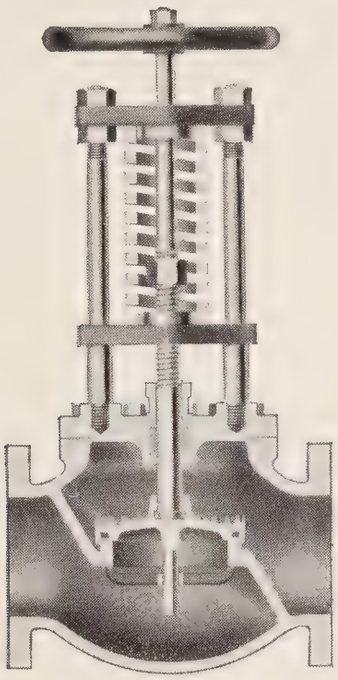
When ordering always specify the catalogue number and state the pressure at which valves are wanted set to relieve, also the quantity of steam to be relieved at the set pressure.

These valves are not made in the Vertical Pattern.

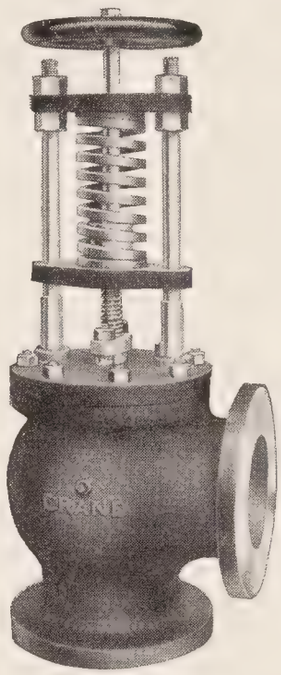
Templates for drilling, see page 596. For general dimensions see page 629.

BACK PRESSURE VALVES

IRON BODY **HORIZONTAL OR ANGLE** **OUTSIDE SPRING**



No. 4387
HORIZONTAL
CODE: DIAMASEME



No. 4389
ANGLE
CODE: DIAPENTON

Size	Inches	2½	3	3½	4	4½	5
Size	Millimeters	64	76	90	100	113	125
No. 4387 Horizontal	Each	79.00	88.00	97.00	113.00	130.00	155.00
No. 4389 Angle	Each	79.00	88.00	97.00	113.00	130.00	155.00
Size	Inches	6	7	8	10	12	
Size	Millimeters	150	175	200	250	300	
No. 4387 Horizontal	Each	183.00	215.00	275.00	345.00	475.00	
No. 4389 Angle	Each	183.00	215.00	275.00	345.00	475.00	

When ordering always specify the style and number and state the pressure at which valves are wanted set to relieve.

The pressure on the inlet side as well as the pressure on the outlet side should always be given.

These Valves are intended for service on exhaust lines on which a certain amount of back pressure is desired. They can be set for any pressure specified from 15 to 35 pounds against atmosphere and from 1 to 20 pounds gauge against vacuum, They can also be used as relief Valves for low pressure systems and set for pressures from 15 to 35 pounds.

These Valves have popping chambers to give them a more positive action than ordinarily found in back pressure Valves. The regulating ring permits changes in the drop of pressure without taking the Valve apart. They also have greater capacity than ordinarily found in the simple weight loaded type of back pressure Valves.

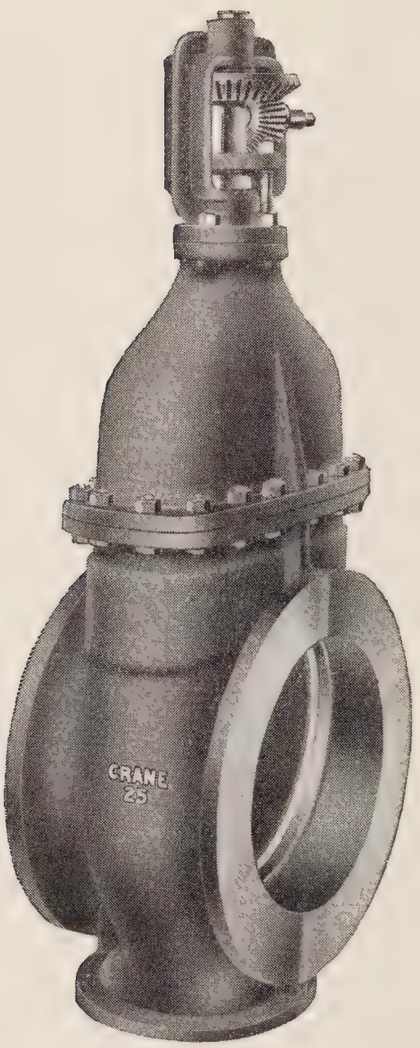
To adjust for different pressures: Turn handwheel to the right to increase pressure, the locknut on the stem will be set for any maximum pressure specified within the limits given above. Turn the handwheel to the left to decrease pressure; after all tension has been taken off the spring, the Valve can be kept in an open position permanently.

When special drilling is required templates for drilling should accompany orders.

An additional charge will be made for special diameter flanges and special drilling.

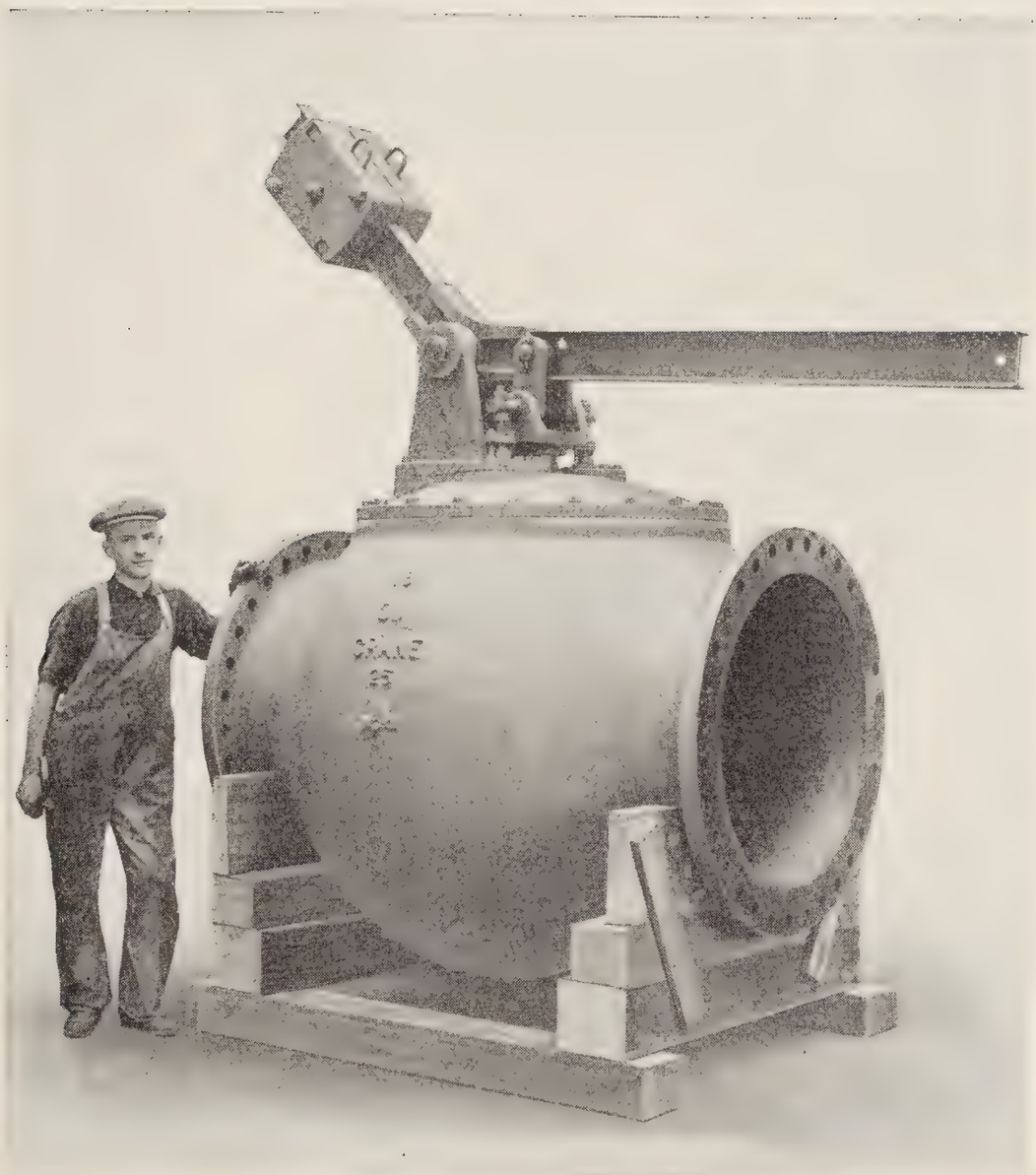
Templates for drilling, page 596.
Price List for Drilling, page 483.
For general dimensions see page 630.

BOTTOM OUTLET GATE VALVES



BOTTOM OUTLET GATE VALVES FURNISHED FOR TURBINE EXHAUST RELIEF AND BLEEDER CONNECTIONS

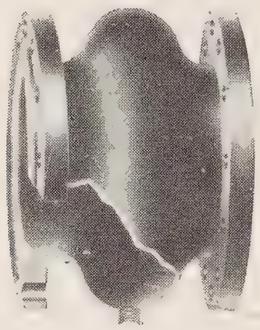
PRICES ON APPLICATION



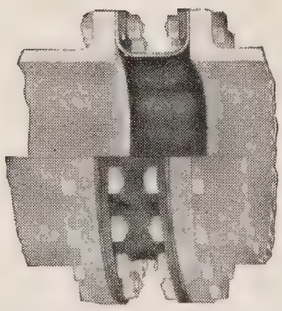
SPECIAL 36-INCH HORIZONTAL EXHAUST RELIEF VALVE

SEE PAGES 240 TO 245 FOR BACK PRESSURE AND EXHAUST RELIEF VALVES

LOW PRESSURE COPPER EXPANSION JOINTS



FOR STEAM WORKING PRESSURES, SIZES 16 INCHES AND SMALLER, UP TO 25 POUNDS, SIZES 18 INCHES AND LARGER, UP TO 15 POUNDS.



No. 411. HORIZONTAL OR VERTICAL WITH CAST IRON SWIVEL FLANGES

CODE: DIASCOLETO

No. 412. HORIZONTAL OR VERTICAL WITH CAST STEEL SPLIT RINGS

CODE: DIBAPHARUM

Size.....Inches	4	5	6	7	8	9
Size.....Millimeters	100	125	150	175	200	225
No. 411 or 412.....Each	110.00	125.00	140.00	155.00	170.00	185.00
Face to Face, No. 411.....Inches	8	9	9	10	10	11
Face to Face, No. 412.....Inches	5 1/2	5 1/2	6	6	6	6
Diam. Flanges and Rings.....Inches	9	10	11	12 1/2	13 1/2	15
Thickness of Steel Ring, No. 412...Inches	3/8	3/8	7/16	7/16	7/16	7/16

Size.....Inches	10	12	14	15	16	18
Size.....Millimeters	250	300	350	375	400	450
No. 411 or 412.....Each	200.00	225.00	250.00	275.00	300.00	350.00
Face to Face, No. 411.....Inches	11	11	12	12	12	13
Face to Face, No. 412.....Inches	6	6	6	6	6	6 1/2
Diam. Flanges and Rings.....Inches	16	19	21	22 1/4	23 1/2	25
Thickness of Steel Ring, No. 412...Inches	1/2	1/2	1/2	1/2	1/2	5/8

Size.....Inches	20	22	24	26	28
Size.....Millimeters	500	550	600	650	700
No. 411 or 412.....Each	400.00	450.00	500.00	600.00	650.00
Face to Face, No. 411.....Inches	13	14	14	15	15
Face to Face, No. 412.....Inches	6 1/2	7	7	8	8
Diam. Flanges and Rings.....Inches	27 1/2	29 1/2	32	34 1/4	36 1/2
Thickness of Steel Ring, No 412...Inches	5/8	3/4	3/4	3/4	3/4

Size.....Inches	30	32	34	36	38
Size.....Millimeters	750	800	850	900	950
No. 411 or 412.....Each	725.00	800.00	875.00	950.00	1000.00
Face to Face, No. 411.....Inches	16	16	17	17	18
Face to Face, No. 412.....Inches	8 1/2	8 1/2	8 1/2	8 1/2	9
Diam. Flanges and Rings.....Inches	38 3/4	41 3/4	43 3/4	46	48 3/4
Thickness of Steel Ring, No. 412...Inches	7/8	7/8	7/8	1	1

Size.....Inches	40	42	44	46	48
Size.....Millimeters	1000	1050	1100	1150	1200
No. 411 or 412.....Each	1100.00	1200.00	1300.00	1400.00	1500.00
Face to Face, No. 411.....Inches	18	19	19	20	20
Face to Face, No. 412.....Inches	9	9	9	9	9
Diam. Flanges and Rings.....Inches	50 3/4	53	55 1/4	57 1/4	59 1/2
Thickness of Steel Ring, No. 412...Inches	1	1 1/8	1 1/8	1 1/8	1 1/4

These Copper Expansion Joints are recommended for use only where the expansion does not exceed 1/4 inch.

The flanges or rings are adjustable, thus making easy the alignment of bolt holes.

Pipe Lines containing these Expansion Joints must be anchored at suitable points, in order to force the Joints to compensate for the contraction and expansion in the piping.

STYLE No. 412 IS ESPECIALLY RECOMMENDED ON HIGH VACUUM SYSTEMS, AS ITS CONSTRUCTION PROVIDES AGAINST DANGER OF COLLAPSING, DUE TO EXTERNAL OR ATMOSPHERIC PRESSURE.

No. 411 is furnished faced and drilled, as shown in illustration.

No. 412 comprises the copper shell and Split Rings only, faced and drilled.

Bolts for No. 411 will be regular diameter and length corresponding to thickness of our Standard Cast Iron Flanges.

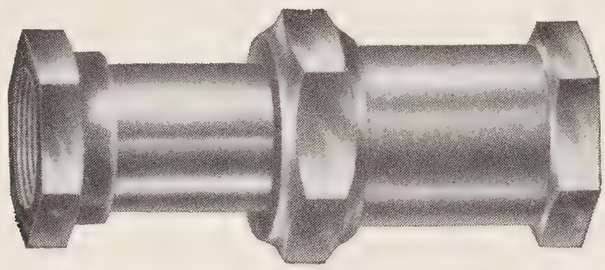
Bolts for No. 412 will be shorter, proportionate to the difference in thickness of the steel ring, as compared with the thickness of Standard Cast Iron Flanges. Templates for drilling, page 596.

STANDARD

EXPANSION JOINTS

ALL BRASS

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS



No. 404. SCREWED, STANDARD TRAVERSE

CODE: DIFENDIAMO

Size.....Inches	½	¾	1	1¼	1½	2	2½	3
Size.....Millimeters	13	19	25	32	38	50	64	76
Traverse.....Inches	2	2¼	2¼	2¼	2¼	2½	2½	2¾
End to End, Open.....Inches	6⅜	7¼	7⅜	7⅜	7⅝	8⅜	9⅛	10⅜
Price.....Each	1.50	2.20	2.75	4.00	5.00	8.00	17.50	24.00

No. 406. SCREWED, SPECIAL TRAVERSE

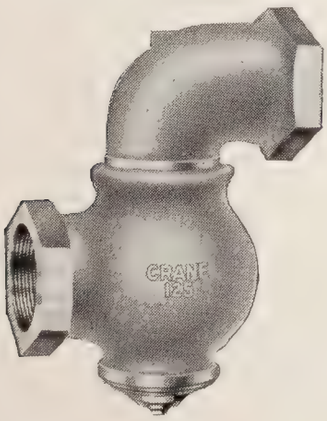
CODE: DIFILIDIA

Traverse	Size.....Inches	½	¾	1	1¼	1½	2	2½
	Size.....Millimeters	13	19	25	32	38	50	64
4 inches	Price.....Each	3.80	4.00	4.90	6.30	7.40	9.10	
*6 inches	Price.....Each		8.25	9.00	10.00	11.50	13.50	24.00
8 inches	Price.....Each		9.00	10.00	11.25	13.00	15.50	27.00
10 inches	Price.....Each		9.75	11.00	12.50	14.50	17.50	30.00
12 inches	Price.....Each		10.50	12.00	13.75	16.00	19.50	33.00

*Eastern Traverse.

Expansion Joints are not furnished packed unless so ordered, and then at a special price. If wanted packed specify kind of packing required.

For linear expansion of pipe, see page 258.



No. 300
CODE: DIGALLIC

STEAM SWING JOINTS

BRASS

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS

Size.....Inches	¼	⅜	½	¾	1	1¼	1½	2	2½	3
Size.....Millimeters	6	9	13	19	25	32	38	50	64	76
Price, Rough.....Each	1.90	2.20	2.50	3.50	5.00	6.50	9.00	13.00	22.00	30.00
Price, Finished.....Each	2.40	2.70	3.00	4.00	5.75	7.25	10.00	15.00	24.50	33.00

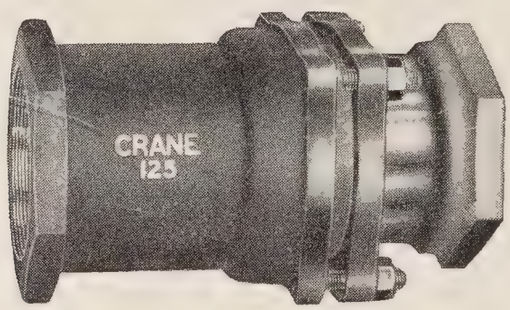
Finished Swing Joints are made to order only.

STANDARD

EXPANSION JOINTS

IRON BODY **BRASS SLEEVES**

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS



No. 398. SCREWED, STANDARD TRAVERSE

CODE: DIGITADO

Size	Inches	2	2½	3	3½	4	4½	5
Size	Millimeters	50	64	76	90	100	113	125
Traverse	Inches	2½	2½	2¾	3	3¼	3½	4
End to End, Opened	Inches	12 7/16	13 3/16	14 3/16	15 1/8	16¼	17	18 3/8
Price	Each	7.00	8.00	10.00	14.00	18.00	30.00	38.00
Size	Inches	6	7	8	9	10	12	
Size	Millimeters	150	175	200	225	250	300	
Traverse	Inches	5	6	7	7	7	8	
End to End, Opened	Inches	21¾	23¼	26 1/16	27	28	31 9/16	
Price	Each	45.00	70.00	100.00	110.00	160.00	225.00	

No. 400. SCREWED, SPECIAL TRAVERSE

CODE: DIGIUDICHI

Traverse	Size . Inches	2	2½	3	3½	4	4½	5	6	7	8
	Size . . . Mill.	50	64	76	90	100	113	125	150	175	200
*6 in.	Price . . Each	11.00	13.00	17.50	25.00	30.00	40.00	45.00	55.00		
10 in.	Price . . Each	16.00	19.00	25.00	35.00	42.00	52.00	62.00	80.00	100.00	140.00
12 in.	Price . . Each	18.50	22.00	29.00	40.00	48.00	60.00	70.00	92.50	115.00	160.00
14 in.	Price . . Each	21.00	25.00	33.00	45.00	54.00	67.00	78.00	105.00	130.00	
16 in.	Price . . Each	23.50	28.00	37.00	50.00	60.00	75.00	86.00	117.50	145.00	
18 in.	Price . . Each	26.00	31.00	41.00	55.00	66.00		94.00	130.00		

*Eastern Traverse.

Expansion Joints are not furnished packed unless so ordered, and then at a special price. If wanted packed specify kind of packing required.

Standard Expansion Joints will be made to order with base or side outlet. Prices on application.

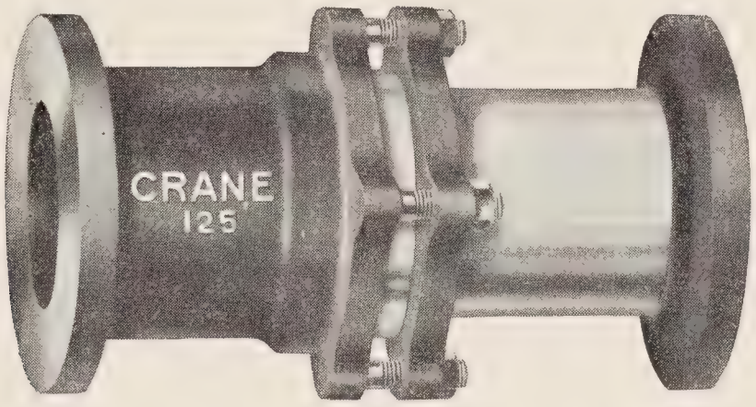
For linear expansion of pipe, see page 258.

All-Iron Expansion Joints made to order.

STANDARD EXPANSION JOINTS

IRON BODY **BRASS SLEEVE**

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS



No. 401. FLANGED, STANDARD TRAVERSE

CODE: DIGYNIAN

Size.....Inches	2	2½	3	3½	4	4½	5	6
Size.....Millimeters	50	64	76	90	100	113	125	150
Traverse.....Inches	2½	2½	2¾	3	3¼	3½	4	5
Face to Face, Opened...Inches	11 3/8	11 1/16	12 11/16	13 13/16	14¾	15½	16 5/8	19½
Price.....Each	15.00	16.00	18.50	25.00	30.00	40.00	48.00	55.00
Diam. Flanges...Inches	6	7	7½	8½	9	9¼	10	11
Size.....Inches	7	8	9	10	12	14	15	16
Size.....Millimeters	175	200	225	250	300	350	375	400
Traverse.....Inches	6	7	7	7	8	10	10	10
Face to Face, Opened...Inches	22 9/16	25 5/16	26¼	27	30 5/8	39¼	40	41
Price.....Each	80.00	110.00	120.00	175.00	250.00	500.00	550.00	600.00
Diam. Flanges...Inches	12½	13½	15	16	19	21	22¼	23½

No. 403. FLANGED, SPECIAL TRAVERSE

CODE: DIRUBARONO

Traverse							
	Size.....Inches	2	2½	3	3½	4	4½
	Size.....Millimeters	50	64	76	90	100	113
*6 Inches.....	Price.....Each	18.00	20.00	25.00	35.00	40.00	50.00
10 Inches.....	Price.....Each	23.00	26.00	32.50	45.00	52.00	63.00
12 Inches.....	Price.....Each	25.50	29.00	36.50	50.00	58.00	70.00
14 Inches.....	Price.....Each	28.00	32.00	40.50	55.00	64.00	77.00
16 Inches.....	Price.....Each	30.50	35.00	44.50	60.00	70.00	85.00
18 Inches.....	Price.....Each	33.00	38.00	48.50	65.00	76.00	

Traverse							
	Size.....Inches	5	6	7	8	10	12
	Size.....Millimeters	125	150	175	200	250	300
*6 Inches.....	Price.....Each	55.00	65.00				
10 Inches.....	Price.....Each	72.00	90.00	112.00	150.00	225.00	300.00
12 Inches.....	Price.....Each	80.00	102.50	127.00	170.00	255.00	350.00
14 Inches.....	Price.....Each	88.00	115.00	142.00	190.00	285.00	400.00
16 Inches.....	Price.....Each	96.00	127.50	157.00	210.00	315.00	
18 Inches.....	Price.....Each	104.00	140.00	172.00	230.00	350.00	

*Eastern Traverse.

Expansion Joints are not furnished packed unless so ordered, and then at a special price. If wanted packed specify kind of packing required.

Standard Expansion Joints will be made to order with base or with side outlet. Prices on application.

All-Iron Expansion Joints made to order.

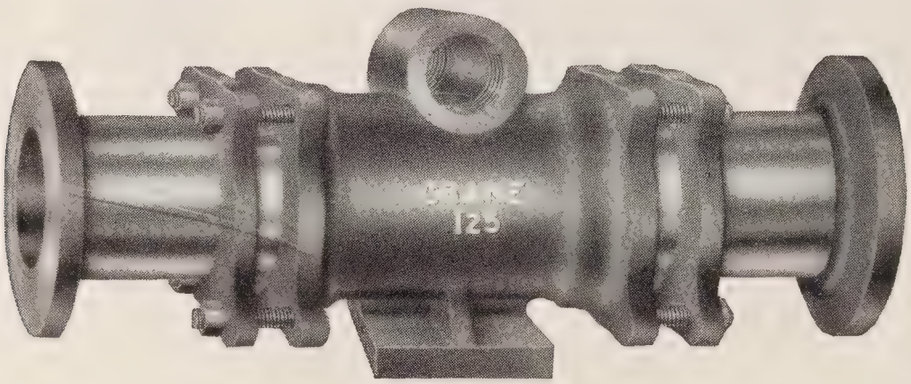
For linear expansion of pipe, see page 258.

Templates for drilling, page 596. Price List for drilling, page 483.

DOUBLE EXPANSION JOINTS

IRON BODY **BRASS SLEEVES**

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS



No. 409

FLANGED

WITH ANCHORAGE SADDLE BASE AND LATERAL SERVICE BRANCH

CODE: DISCORDABO

Size.....Inches	2	2½	3	3½	4	4½	5	6
Size.....Millimeters	50	64	76	90	100	113	125	150
No. 409, Flanged. Each	35.00	40.00	45.00	60.00	75.00	90.00	105.00	130.00
Traverse on Each Sleeve.. Inches	4	4	4	4	4	4	4	4
Service Opening. Inches	2	2	2	2	2½	2½	3	3
End to End, Open, Screwed . .In.	29¾	30⅞	31¾	33	34¼	34⅜	35¼	36½
Face to Face, Open, Flanged . .In.	28	28½	29½	30¾	31¾	32	32½	34
Diam.of Flanges... In	6	7	7½	8½	9	9¼	10	11
Size.....Inches	7	8	9	10	12	14	15	16
Size.....Millimeters	175	200	225	250	300	350	375	400
No. 409, Flanged. Each	165.00	200.00	250.00	300.00	400.00	600.00	700.00	800.00
Traverse on Each Sleeve.. Inches	4	4	4	3½	3½	3½	3½	3½
Service Opening. Inches	4	4	4	4	4½	4½	5	5
End to End, Open, Screwed...In.	36¼	37¾	39¾	39¼	43			
Face to Face, Open, Flanged.. In.	36¼	37¾	39¾	39¼	43	45	46½	48½
Diam. of Flanges.. In.	12½	13½	15	16	19	21	22¼	23½

These Expansion Joints will be furnished with screwed ends when so specified, at same price.

Unless otherwise specified, Expansion Joints 4½-inch and smaller will be made with screwed service outlet, and Expansion Joints 5-inch and larger, flanged service outlets.

The above Double Expansion Joints are made of the same general proportions as our Standard Patterns and are more particularly designed for underground work.

Expansion Joints are not furnished packed unless so ordered, and then at a special price. If wanted packed, specify kind of packing required.

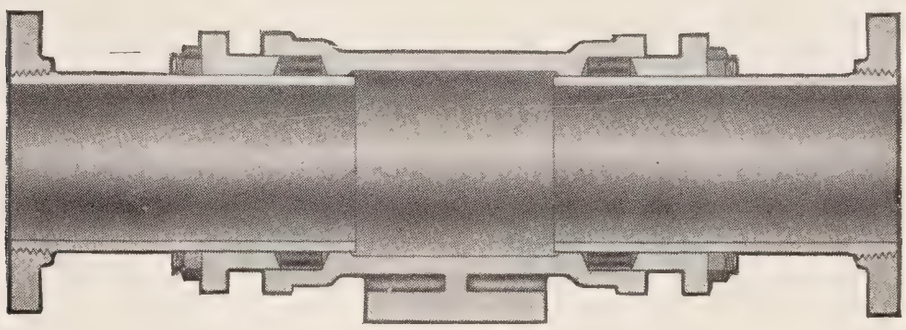
Single Standard Expansion Joints can also be furnished with Base and Lateral Service Branch. These will be made to order only. Prices on application.

Templates for drilling, page 596. Price list for drilling, page 483.

DOUBLE EXPANSION JOINTS

IRON BODY **BRASS SLEEVES**

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS



No. 408

WITH ANCHORAGE SADDLE BASE

CODE: DISCUSSIFS

Size.....Inches	2	2½	3	3½	4	4½	5	6
Size.....Millimeters	50	64	76	90	100	113	125	150
No. 408, Flanged. Each	32.50	37.50	42.50	55.00	70.00	85.00	100.00	120.00
Traverse on Each Sleeve.. Inches	4	4	4	4	4	4	4	4
End to End, Open, Screwed. Inches	29¾	30⅞	31¾	33	34¼	34⅜	35¼	36½
Face to Face, Open, Flanged. Inches	28	28½	29½	30¾	31¾	32	32½	34
Diam.ofFlanges.Inches	6	7	7½	8½	9	9¼	10	11
Size.....Inches	7	8	9	10	12	14	15	16
Size.....Millimeters	175	200	225	250	300	350	375	400
No. 408, Flanged. Each	155.00	190.00	240.00	290.00	390.00	575.00	675.00	775.00
Traverse on Each Sleeve.. Inches	4	4	4	3½	3½	3½	3½	3½
End to End, Open, Screwed. Inches	36¼	37¾	39¾	39¼	43			
Face to Face, Open, Flanged. Inches	36¼	37¾	39¾	39¼	43	45	46½	48½
Diam.of Flanges.Inches	12½	13½	15	16	19	21	22¼	23½

These Expansion Joints will be furnished with screwed ends, when so specified, at same price.

The above Double Expansion Joints are made of the same general proportions as our Standard Patterns and are more particularly designed for underground work.

Expansion Joints are not furnished packed unless so ordered, and then at a special price. If wanted packed, specify kind of packing required.

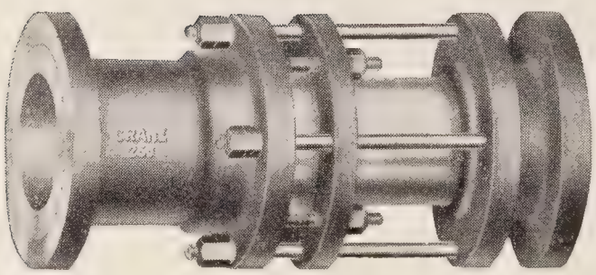
Single Standard Expansion Joints can also be furnished with Base. These will be made to order only. Prices on application.

Templates for drilling, page 596. Price list for drilling, page 483.

EXTRA HEAVY EXPANSION JOINTS

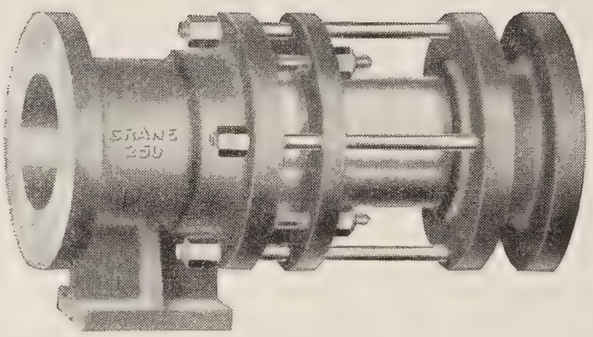
IRON BODY WITH TIE RODS BRASS SLEEVE

FOR SATURATED STEAM WORKING PRESSURES UP TO 250 POUNDS



No. 49 E

CODE: DISJUNGETO



No. 49 E
WITH ANCHOR BASE

CODE: DISOMATOUS

STANDARD TRAVERSE

Size.....Inches	2	2½	3	3½	4	5	6	7
Size.....Millimeters	50	64	76	90	100	125	150	175
No.48 E,Screwed.Each	30.00	40.00	50.00	60.00	70.00	80.00	100.00	120.00
No.49 E,Flanged.Each	35.00	45.00	55.00	65.00	75.00	85.00	105.00	125.00
Traverse.....Inches	2½	2½	2¾	3	3¼	4	5	6
E. to E., Screwed, Opened..Inches	15⅛	15 13/16	16⅞	18	18⅞	21⅝	24⅞	27⅞
F. to F., Flanged, Opened..Inches	15½	16	17⅝	18 11/16	19½	22⅜	25¾	28½
Diam. Flanges..Inches	6½	7½	8¼	9	10	11	12½	14
Size.....Inches	8	9	10	12	14	15	16	18
Size.....Millimeters	200	225	250	300	350	375	400	450
No.48 E,Screwed.Each	145.00	190.00	240.00	290.00				
No.49 E,Flanged.Each	150.00	200.00	250.00	300.00	500.00	500.00	750.00	1000.00
Traverse.....Inches	7	7	7	8	10	10	10	10
E. to E., Screwed, Opened..Inches	30¾	31¾	32¾	36 15/16				
F. to F., Flanged, Opened..Inches	31½	31¾	33½	37¾	43	43	45	46⅛
Diam. Flanges..Inches	15	16¼	17½	20½	23	24½	25½	28

Prices of Expansion Joints with Anchor Base on application.

Expansion Joints are not furnished packed unless so ordered, and then at a special price. If wanted packed, specify kind of packing required.

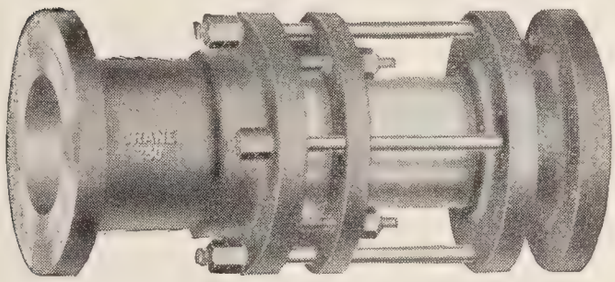
For linear expansion of pipe, see page 258.

Templates for drilling, page 598. Price List for drilling, page 484.

EXTRA HEAVY EXPANSION JOINTS

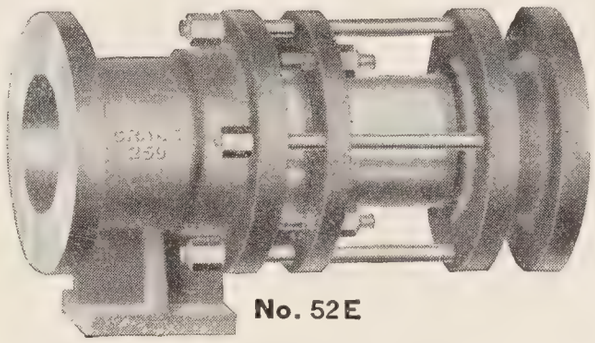
IRON BODY **WITH TIE RODS** **BRASS SLEEVE**

FOR SATURATED STEAM WORKING PRESSURES UP TO 250 POUNDS



No. 52 E

CODE: DISUNIBILE



No. 52E

WITH ANCHOR BASE

CODE: DITIFICAVI

PRICE LIST—No. 50 E SCREWED—SPECIAL TRAVERSE

Traverse	Size.....Inches	2	2½	3	3½	4
	Size.....Millimeters	50	64	76	90	100
4 in.	No. 50 E, Screwed.....Each	35.00	45.00	55.00	65.00	75.00
6 in.	No. 50 E, Screwed.....Each	40.00	50.00	60.00	70.00	80.00
10 in.	No. 50 E, Screwed.....Each	45.00	55.00	65.00	75.00	85.00
12 in.	No. 50 E, Screwed.....Each	50.00	60.00	70.00	80.00	90.00
14 in.	No. 50 E, Screwed.....Each	55.00	65.00	75.00	85.00	95.00
16 in.	No. 50 E, Screwed.....Each	60.00	70.00	80.00	90.00	100.00

Traverse	Size.....Inches	5	6	7	8	
	Size.....Millimeters	125	150	175	200	
6 in.	No. 50 E, Screwed.....Each	85.00	105.00			
10 in.	No. 50 E, Screwed.....Each	95.00	125.00	145.00	175.00	
12 in.	No. 50 E, Screwed.....Each	105.00	135.00	160.00	205.00	
14 in.	No. 50 E, Screwed.....Each	115.00	145.00	175.00	235.00	
16 in.	No. 50 E, Screwed.....Each	125.00	155.00	190.00	265.00	

PRICE LIST—No. 52 E FLANGED—SPECIAL TRAVERSE

Traverse	Size.....Inches	2	2½	3	3½	4
	Size.....Millimeters	50	64	76	90	100
4 in.	No. 52 E, Flanged.....Each	40.00	50.00	60.00	70.00	80.00
6 in.	No. 52 E, Flanged.....Each	45.00	55.00	65.00	75.00	85.00
10 in.	No. 52 E, Flanged.....Each	50.00	60.00	70.00	80.00	90.00
12 in.	No. 52 E, Flanged.....Each	55.00	65.00	75.00	85.00	95.00
14 in.	No. 52 E, Flanged.....Each	60.00	70.00	80.00	90.00	100.00
16 in.	No. 52 E, Flanged.....Each	65.00	75.00	85.00	95.00	105.00

Traverse	Size.....Inches	5	6	7	8	
	Size.....Millimeters	125	150	175	200	
6 in.	No. 52 E, Flanged.....Each	90.00	110.00			
10 in.	No. 52 E, Flanged.....Each	100.00	130.00	150.00	180.00	
12 in.	No. 52 E, Flanged.....Each	110.00	140.00	165.00	210.00	
14 in.	No. 52 E, Flanged.....Each	120.00	150.00	180.00	240.00	
16 in.	No. 52 E, Flanged.....Each	130.00	160.00	195.00	270.00	

Prices of Expansion Joints with Anchor Base furnished on application.

Expansion Joints are not furnished packed unless so ordered, and then at a special price. If wanted packed, specify kind of packing required.

Made to order with longer traverse than above, at a special price.

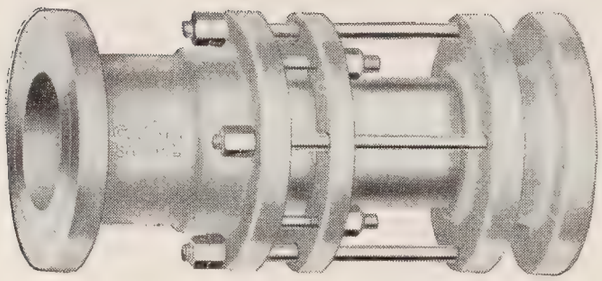
For linear expansion of pipe, see page 258.

Templates for drilling, page 598. Price List for drilling, page 484.

EXTRA HEAVY

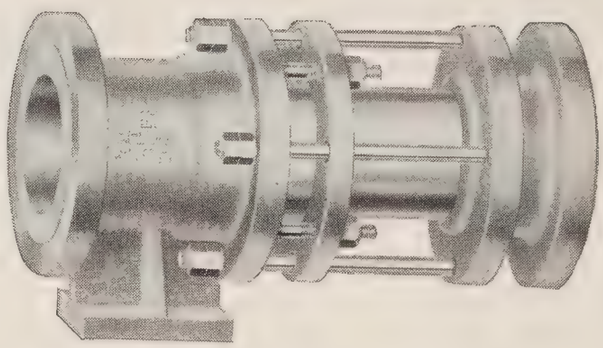
CAST STEEL EXPANSION JOINTS

WITH TIE RODS



No. 49A. STEEL

CODE: DIVITIACUS



No. 49A. STEEL
WITH ANCHOR BASE

CODE: DOUBLIRTE

SPECIFICATION "A" FURNISHED UNLESS OTHERWISE ORDERED

Size	Inches	4	5	6	8	10	12
Size	Millimeters	100	125	150	200	250	300
No. 49-A, Flanged	Each	150.00	175.00	200.00	250.00	325.00	400.00
No. 49-H, Flanged	Each	90.00	110.00	135.00	200.00	275.00	325.00
Traverse	Inches	3¼	4	5	7	7	8
Face to Face, Open	Inches	19½	22⅜	25¾	31½	33⅝	37 11/16
Diameter of Flanges	Inches	10	11	12½	15	17½	20½

GENERAL SPECIFICATIONS

Class A — **350 POUNDS SUPERHEATED STEAM WORKING PRESSURE WITH TOTAL TEMPERATURE OF 800° FAHRENHEIT.**

Cast Steel Body, Spool and Gland, with Body and Gland bushed with Crane Special Brass.
Sleeve—Steel Pipe.

STEEL BOLTS OF HIGH TENSILE STRENGTH or commercial bolts larger in diameter must be used on flanges when they are subjected to steam working pressures in excess of 300 pounds.

A. S. M. E. EXTRA HEAVY BOLTING using commercial bolts is not strong enough for steam working pressures in excess of 300 pounds.

Class H — **500 POUNDS COLD WATER AND 400 POUNDS HOT WATER WORKING PRESSURE**

Cast Steel Body, Spool and Gland, with Body and Gland bushed with Crane Special Brass.
Sleeve—Crane Special Brass or Brass Tubing, depending on size.

Prices of Expansion Joints with Anchor Base on application.

Expansion Joints are not furnished packed unless so ordered, and then at a special price. If wanted packed, specify kind of packing required.

In ordering, always specify by NUMBER and LETTER denoting combination wanted.

Cast Steel Expansion Joints for higher working pressures made to order.

For drilling templates, see page 598. Price List for drilling, see page 485.

For linear expansion of pipe, see page 258.

All End Flanges are furnished with 1/16 inch raised face, for diameters, see page 665.

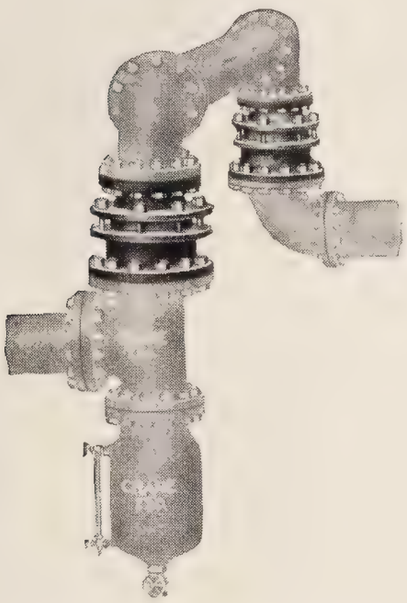
EXTRA HEAVY

SWIVEL EXPANSION JOINTS

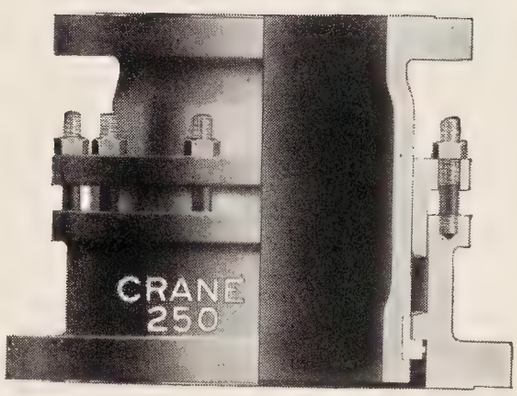
CAST IRON FLANGED

BRASS BEARINGS AND SPLIT SHOULDER RINGS

FOR SATURATED STEAM WORKING PRESSURES UP TO 250 POUNDS



ILLUSTRATING METHODS OF PLACING SWIVEL EXPANSION JOINTS IN A STEAM LINE



No. 51 E SWIVEL JOINT

CODE: DOVENDOMI

Size Inches	Size Milli-meters	Price Swivel Joint Only Each	Price for Drilling Per Joint	Bolts Per Set	Face to Face Inches	Diameter of Sleeve Flange Inches	Diameter of Body Flange Inches
3	76	70.00	1.25	1.35	10	8¼	5x11
3½	90	80.00	1.50	1.35	10⅜	9	5x11
4	100	90.00	1.75	2.00	11⅛	10	6x12½
5	125	105.00	2.00	2.50	12	11	7x14
6	150	120.00	2.50	2.95	12¾	12½	9x16¼
7	175	140.00	2.50	4.30	13½	14	10x17½
8	200	170.00	2.50	4.30	14½	15	12x20½
10	250	250.00	4.00	5.85	16¼	17½	14x23
12	300	300.00	5.00	5.85	18	20½	16x25½
14	350	500.00	6.00	7.25	20	23	18x28
16	400	750.00	7.50	10.55	21¾	25½	22x33

Sizes above 16-inch, prices on application.

These Joints will be made to order of Ferrosteel, at an extra price.

It will be noted that the sleeve and body Flanges are the regular Extra Heavy diameters and are drilled to the regular Extra Heavy templates. Templates for drilling, page 598.

The construction of these Joints is such that they will make an entire revolution without danger of the sleeves blowing out.

All bearing parts are faced with brass; in consequence, they will not corrode, stick or bind.

These Joints will be furnished with stuffing box packed at an additional price which will depend upon the kind of packing required.

EXPANSION OF STEAM PIPES

The linear expansion and contraction of pipe, due to differences of temperature of the fluid carried and the surrounding air, must be cared for by suitable expansion joints or bends.

In order to determine the amount of expansion or contraction in a pipe line, we give below a table showing the increase in length of a pipe 100 feet long at various temperatures.

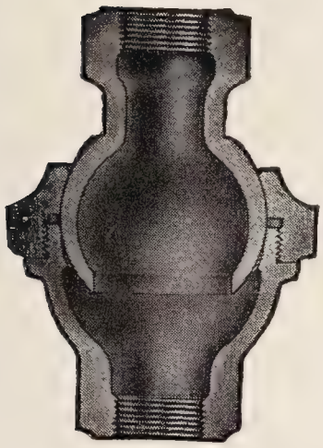
The expansion for any length of pipe may be found by taking the difference in increased length at the minimum and maximum temperatures, dividing by 100 and multiplying by the length of the line under consideration.

EXPANSION OF PIPE

INCREASE IN LENGTH—INCHES PER 100 FEET

Temperature, Degrees F.	Steel	Wrought Iron	Cast Iron	Brass and Copper
0	0	0	0	0
20	.15	.15	.10	.25
40	.30	.30	.25	.45
60	.45	.45	.40	.65
80	.60	.60	.55	.90
100	.75	.80	.70	1.15
120	.90	.95	.85	1.40
140	1.10	1.15	1.00	1.65
160	1.25	1.35	1.15	1.90
180	1.45	1.50	1.30	2.15
200	1.60	1.65	1.50	2.40
220	1.80	1.85	1.65	2.65
240	2.00	2.05	1.80	2.90
260	2.15	2.20	1.95	3.15
280	2.35	2.40	2.15	3.45
300	2.50	2.60	2.35	3.75
320	2.70	2.80	2.50	4.05
340	2.90	3.05	2.70	4.35
360	3.05	3.25	2.90	4.65
380	3.25	3.45	3.10	4.95
400	3.45	3.65	3.30	5.25
420	3.70	3.90	3.50	5.60
440	3.95	4.20	3.75	5.95
460	4.20	4.45	4.00	6.30
480	4.45	4.70	4.25	6.65
500	4.70	4.90	4.45	7.05
520	4.95	5.15	4.70	7.45
540	5.20	5.40	4.95	7.85
560	5.45	5.70	5.20	8.25
580	5.70	6.00	5.45	8.65
600	6.00	6.25	5.70	9.05
620	6.30	6.55	5.95	9.50
640	6.55	6.85	6.25	9.95
660	6.90	7.20	6.55	10.40
680	7.20	7.50	6.85	10.95
700	7.50	7.85	7.15	11.40
720	7.80	8.20	7.45	11.90
740	8.20	8.55	7.80	12.40
760	8.55	8.90	8.15	12.95
780	8.95	9.30	8.50	13.50
800	9.30	9.75	8.90	14.10

STANDARD FLEXIBLE JOINTS



"MORAN" TYPE

These Joints are of the loose type construction and become tight when the pressure is put on.

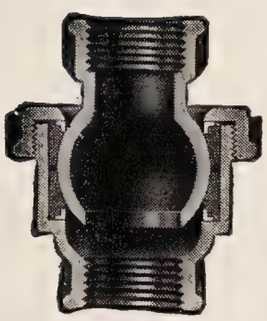
Tight Joints will be made to order at a special price.

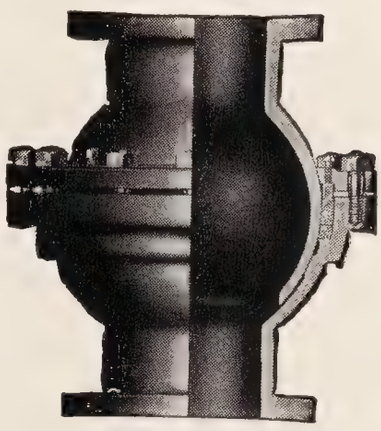
CODE: DOWNINGIA

Size.....Inches	¼	⅜	½	¾	1	1¼	1½
Size.....Millimeters	6	10	13	19	25	32	38
Price.....Each	6.00	6.00	6.50	7.50	8.50	10.50	12.00
Size.....Inches	2	2½	3	3½	4	5	6
Size.....Millimeters	50	64	76	90	100	125	150
Price.....Each	15.00	18.00	22.50	28.00	30.00	40.00	60.00

Both ends are female; Iron Pipe Standard Threads.
The above Joints are All Iron. Will make to order All Brass, at a special price.

BARCO
FLEXIBLE JOINTS





CODE: DRACHENBAU

Size.....Inches	¼	⅜	½	¾	1	1¼	1½
Size.....Millimeters	6	10	13	19	25	32	38
Straight.....Each	7.50	7.50	7.50	8.80	9.90	12.30	14.00
Angle.....Each	8.00	8.00	8.00	9.30	10.40	12.80	14.50
Size.....Inches	2	2½	3	4	5	6	
Size.....Millimeters	50	64	76	100	125	150	
Straight.....Each	17.50	21.00	26.30	35.10	43.90	58.50	
Angle.....Each	19.50	23.00	28.30	38.10	47.90	63.50	

In ordering, please specify whether brass, malleable or cast iron joints are wanted, using the following as a guide as to how they are regularly made:

BRASS.—¼-inch to 2-inch, both male and female ends.

MALLEABLE.—¼-inch to 2½-inch, both male and female ends.

MALLEABLE.—3-inch, male on ball end only.

CAST IRON.—3-inch to 6-inch, male on ball end only.

Standard joints are suitable for steam working pressures up to 150 pounds and extra heavy joints up to 250 pounds.

Sizes 4 inches to 36 inches will be furnished flanged at a special price.

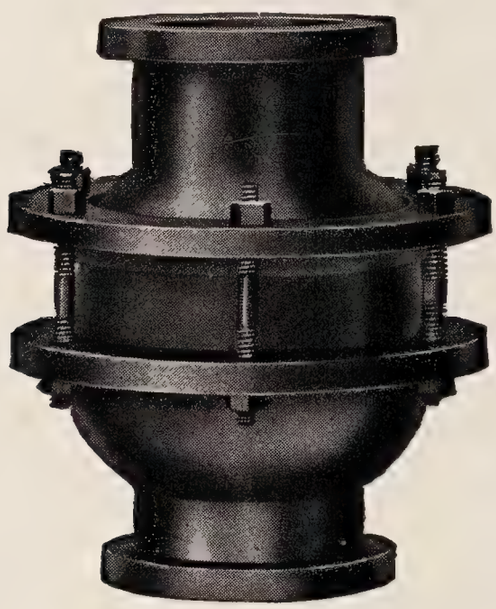
WALKER

FLEXIBLE JOINTS

PATENTED

FOR SUBMERGED PIPE LINES

GAS SUCTION OR PRESSURE MAINS



CODE: ECHEPOLIS

Size Inches	Size Milli-meters	Screwed Each	Flanged Each	Hub and Spigot Each	Approximate Weight Screwed	Flanged	Hub and Spigot
3	76	15.50	23.00		70	110	
4	100	26.00	29.00	28.00	125	150	
6	150	34.50	37.50	34.50	210	210	200
8	200	40.00	44.00	40.00	300	300	300
10	250		69.00	66.00	550	575	575
12	300		87.00	84.00		700	750
14	350		112.00	108.00		900	925
16	400		143.00	137.00		1150	1300
18	450		194.00			1550	
20	500		210.00	200.00		1675	1700
24	600		230.00	220.00		1850	1800
36	900		440.00			4850	

Flexible Joints are used in the laying of Submarine Pipe Lines of all kinds, but more especially where a Diver is not employed.

An excellent proof of the merits of these Joints, is the fact that they have been adopted and have given satisfaction in upwards of one hundred submarine pipe lines, under pressure of from 10 to 250 pounds.

In ordering, state whether Screwed, Flanged or Hub and Spigot ends are wanted.

Drilling of Flanged Joints at an extra price, when so ordered.

CRANETILT STEAM TRAPS

(PATENTED)
(PATENTS PENDING)

NON-RETURN, DIRECT RETURN, THREE-VALVE LIFTING AND VACUUM

FOR PRESSURES UP TO 250 POUNDS PER SQUARE INCH

CRANETILT STEAM TRAPS

Will handle condensation from all sources, and under any pressure of steam up to 250 pounds.

Their discharging capacities are much greater than any other style Steam Trap now on the market, and the Non-Return will handle many times more water than bucket, pot or float traps having equal size pipe connections.

The Direct Return will automatically return all condensation, at any pressure or temperature, directly back into the boiler, and will deliver feed water to the boiler in place of a boiler feed pump.

Cranetilt Three Valve Traps are designed to be used as Lifting, Vacuum or Metering Traps, and are especially adapted for use on return lines handling condensation under varying pressures, especially where the pressure will vary from a vacuum to high steam pressure.

CONSTRUCTIONAL REASONS WHY "CRANETILT" ARE SUPERIOR TO ALL OTHER STEAM TRAPS

THE RECEIVING OR TILTING TANK is made of malleable iron, cast in one piece of uniform thickness; it is perfectly balanced and combines great strength and durability. These tanks are tested to 800 pounds hydraulic pressure per square inch and are fully capable of withstanding severe strains, overcoming entirely the troubles which heretofore have been experienced with other style tanks.

ALL OPERATING PARTS ARE ON THE OUTSIDE, easily accessible for examination or repairs, and are very simple in construction. The trunnions and all interior passages throughout the Traps have full size openings. Proper operation of the trap can be easily noted by the tilting movement.

THE DISCHARGE AND DUPLEX VALVES are of special design and have exceptionally large openings. They are frictionless and perfect in action. The body and bonnet are extra heavy cast iron. The brass working parts are made of "Crane Hard Metal."

WIDE RANGE OF APPLICATION

As Cranetilt Traps, Non-Return, Direct Return, and 3-Valve Lifting, are adapted to such a wide range of application, we do not attempt to illustrate or fully describe the varied and almost unlimited service which they are capable of performing. The principle and operation being practically alike in nearly all cases, it will be understood that the location of Trap, arrangements of piping, etc., may vary to suit the requirements and local conditions covering each application.

TRAP PROBLEMS

Customers having condensation problems to overcome are requested to submit fully described conditions, with sketch if possible, and we shall be pleased to furnish complete information.

NON-RETURN

CRANETILT STEAM TRAPS

FOR STEAM WORKING PRESSURES UP TO 250 POUNDS

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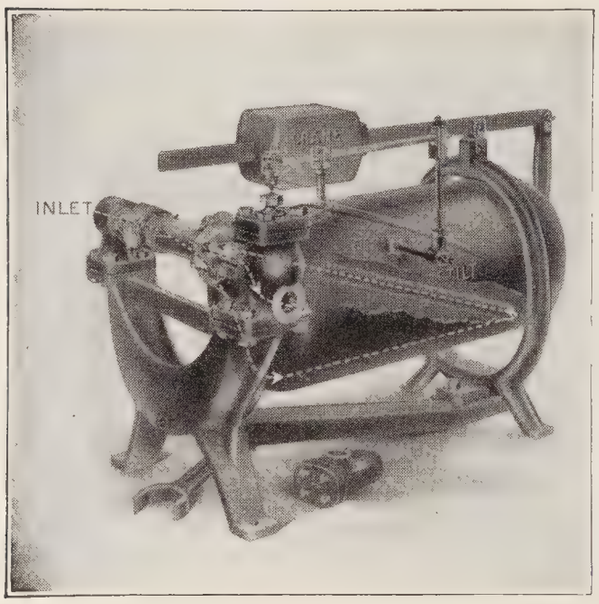
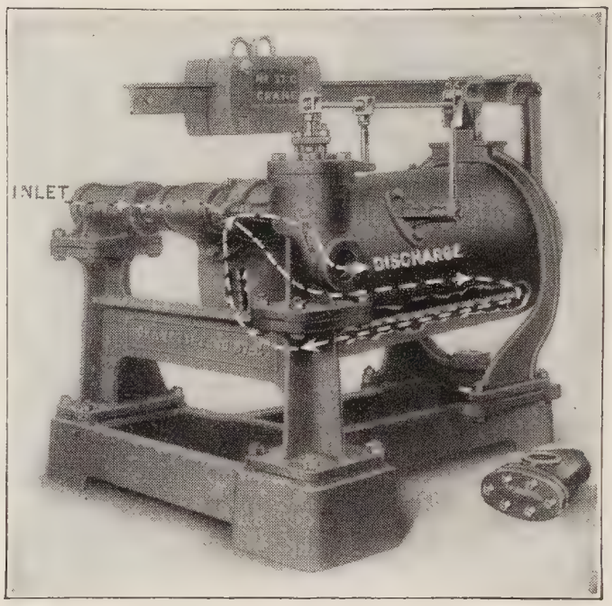


NOS. 30, 32, 33, 34, 35



NOS. 36, 37, 38, 39

SERIES 30—PRICE LIST

Pipe Connections Size of Inlet and Outlet		Number of Trap	List Price, Including Sediment Trap and Wrench	Approximate Shipping Weight Pounds
Inches	Millimeters			
¼	6	30	56.00	95
½	13	32	69.00	170
¾	19	33	94.00	250
1	25	34	125.00	320
1¼	32	35	181.00	510
1½	38	36	263.00	850
2	50	37	375.00	1175
2½	64	38	530.00	1750
3	76	39	690.00	2600

FOR RATINGS AND CAPACITIES, SEE PAGE 263

MERITS OF CRANETILT NON-RETURN STEAM TRAPS

The Cranetilt Non-Return Trap is an economical, simple and practical device to be used for automatically disposing of condensation which has collected from steam under any pressure. Lubricating oils or steam are not used as in the case of a pump. Its durability is unlimited and the necessity for repairs is reduced to a minimum. The discharge valve is on the outside, is easily accessible, simple in construction and has an area 50 per cent greater than the area of the inlet pipe. The trunnion has the full area of the pipe or inlet connection, giving the trap exceptionally large discharging capacity.

THIS TRAP WILL NOT DISCHARGE WATER INTO A BOILER

RATINGS OF

CRANETILT NON-RETURN TRAPS

POUNDS OF WATER DISCHARGED PER HOUR BY VARIOUS EFFECTIVE PRESSURES AT THE TRAP

The capacity of any steam trap is determined by the area of the valve opening and the effective pressure available at the trap.

To determine the size of a Cranetilt Non-Return Steam Trap by the following table:

Find in the first column the pressure equal to the effective pressure at the trap; follow the horizontal line across the table to the quantity of water to be handled per hour; the correct size and number of trap will be found at the head of the column.

This table is based on discharging the trap to atmosphere without lifting the water against a head. If trap discharges against head, subtract one pound from the operating pressure for every two feet of head, and the resulting figure should be taken as pressure in the first column.

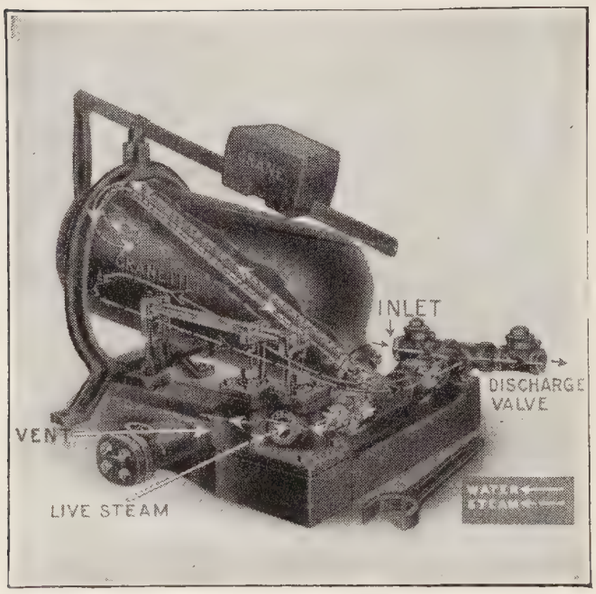
Pressure at Trap Pounds per Sq. Inch.	Number of Trap and Size of Inlet and Outlet.								
	No. 30 ¼-in.	No. 32 ½-in.	No. 33 ¾-in.	No. 34 1-in.	No. 35 1¼-in.	No. 36 1½-in.	No. 37 2-in.	No. 38 2½-in.	No. 39 3-in.
	6-Mil.	13-Mil.	19-Mil.	25-Mil.	32-Mil.	38-Mil.	50-Mil.	64-Mil.	76-Mil.
	Pounds of Water to Be Handled Per Hour								
5	372	930	1,860	3,100	4,650	6,200	9,300	12,400	15,500
10	528	1,320	2,640	4,400	6,600	8,800	13,200	17,600	22,000
15	648	1,620	3,240	5,400	8,100	10,800	16,200	21,600	27,000
20	756	1,890	3,780	6,300	9,450	12,600	18,900	25,200	31,500
25	852	2,130	4,260	7,100	10,650	14,200	21,300	28,400	35,500
30	920	2,310	4,620	7,700	11,550	15,400	23,100	30,800	38,500
40	1,080	2,700	5,400	9,000	13,500	18,000	27,000	36,000	45,000
50	1,200	3,000	6,000	10,000	15,000	20,000	30,000	40,000	50,000
60	1,320	3,300	6,600	11,000	16,500	22,000	33,000	44,000	
75	1,488	3,720	7,440	12,400	18,600	24,800	37,200	49,600	
100	1,704	4,260	8,520	14,200	21,300	28,400	42,600		
125	1,896	4,740	9,480	15,800	23,700	31,600	47,400		
150	2,064	5,160	10,320	17,200	25,800	34,400			
175	2,292	5,730	11,460	19,100	28,650	38,200			
200	2,400	6,000	12,000	20,000	30,000				
250	2,700	7,750	13,500	22,500	33,750				

DIRECT RETURN

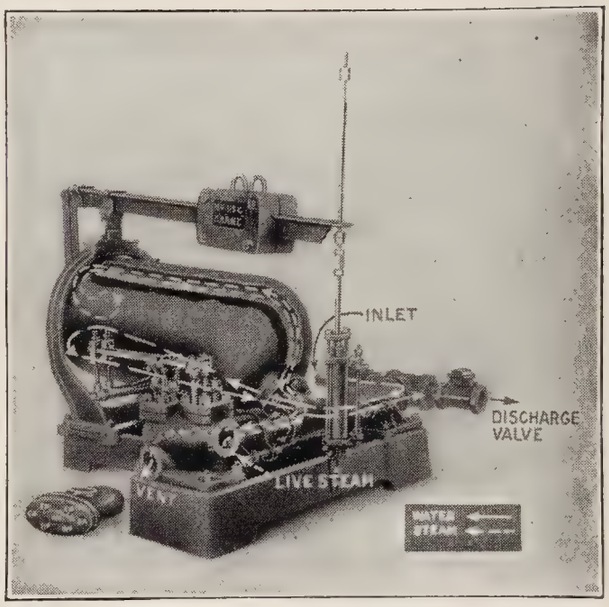
CRANETILT STEAM TRAPS

FOR STEAM WORKING PRESSURES UP TO 250 POUNDS

CODE: ECORNURES



Nos. 90, 91, 92, 93



Nos. 94, 95, 96, 97, 98

SERIES 90—PRICE LIST AND CAPACITIES

Pipe Connections		Number of Trap	List Price Including Sediment Trap, Two Swing Check Valves, Tee, Nipples and Wrench	Approximate Shipping Weight, Pounds	Capacities per Hour, Based on Ordinary Condensing Conditions		
Size of Water Inlet and Discharge					Lineal Feet of 1-Inch Pipe Trap will Drain, Feet	Pounds of Water Trap will Discharge into Boiler, Pounds	Square Feet of Radiation Trap will Drain Square Feet
Inches	Millimeters						
½	13	90	94.00	187	4,000	800	1,333
¾	19	91	119.00	260	7,500	1,500	2,500
1	25	92	156.00	375	12,500	2,500	4,167
1¼	32	93	220.00	527	18,000	3,600	6,000
1½	38	94	313 00	850	25,000	5,000	8,333
2	50	95	463.00	1,175	39,000	7,800	13,000
2½	64	96	656.00	1,750	57,500	11,500	19,167
3	76	97	845.00	2,600	77,500	15,500	25,833
4	100	98	1156.00	3,900	140,000	28,000	46,667

MERITS OF CRANETILT DIRECT RETURN STEAM TRAPS

The Cranetilt Direct Return Trap will deliver condensation and feed water to a boiler at a temperature as high as the temperature of the water in the boiler, and it is from this function it gets its name, Direct Return Trap.

It will operate with any boiler pressure up to 250 pounds and will handle hot water at any temperature.

This is the most economical, simple and practicable device that can be used for feeding water into boilers, its durability is unlimited and the necessity for repairs is reduced to a minimum.

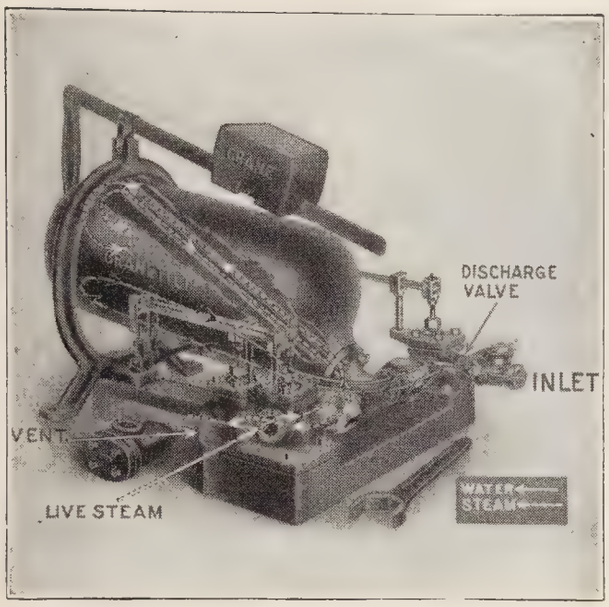
The steam, vent and check valves are on the outside, easily accessible and simple in construction. The trunnions have the full area of the pipe or inlet and discharge connection, giving the trap exceptionally large discharging capacity. The action and working of the trap may be noted at all times, as the tank tilts at each operation.

THREE VALVE LIFTING

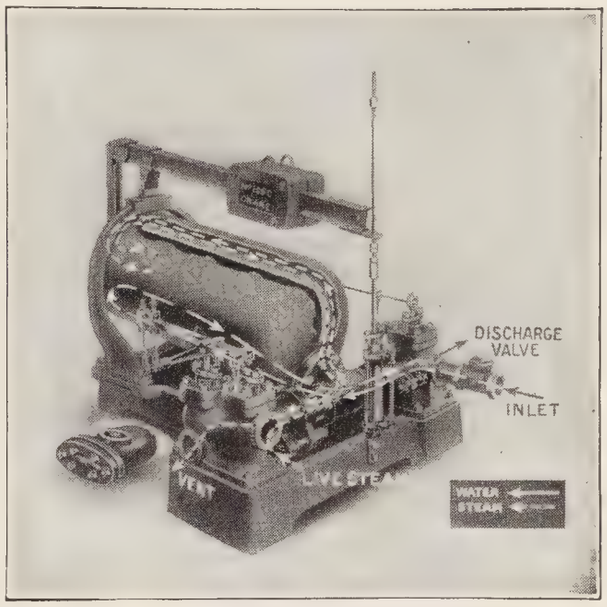
CRANETILT STEAM TRAPS

FOR STEAM WORKING PRESSURES UP TO 250 POUNDS

CODE: ECOUTILLON



Nos. 100, 101, 102, 103



Nos. 104, 105, 106, 107, 108

SERIES 100—PRICE LIST AND CAPACITIES

Pipe Connections		Number of Trap	List Price, Including Sediment Trap, Swing Check Valve, Nipple and Wrench	Approximate Shipping Weight Pounds	Capacities per Hour, Based on Ordinary Condensing Conditions		
Size of Water Inlet and Discharge					Lineal Feet of 1-Inch Pipe Trap will Drain Feet	Pounds of Water Trap will Discharge Per Hour	Square Feet of Radiation Trap will Drain Square Feet
Inches	Millimeters						
½	13	100	113.00	213	6,000	1,200	2,000
¾	19	101	138.00	270	11,250	2,250	3,750
1	25	102	181.00	395	18,750	3,750	6,250
1¼	32	103	250.00	542	27,000	5,400	9,000
1½	38	104	375.00	875	37,500	7,500	12,500
2	50	105	530.00	1,275	58,500	11,700	19,500
2½	64	106	750.00	1,800	86,250	17,250	28,750
3	76	107	970.00	2,650	116,250	23,250	38,750
4	100	108	1345.00	4,000	210,000	42,000	70,000

MERITS OF CRANETILT THREE VALVE TRAPS

Cranetilt Three Valve Traps are designed to be used as Lifting, Vacuum or Metering Traps.

These traps are especially adapted for use on return lines handling condensation under varying pressures, especially where there are variations from a vacuum to high steam pressure.

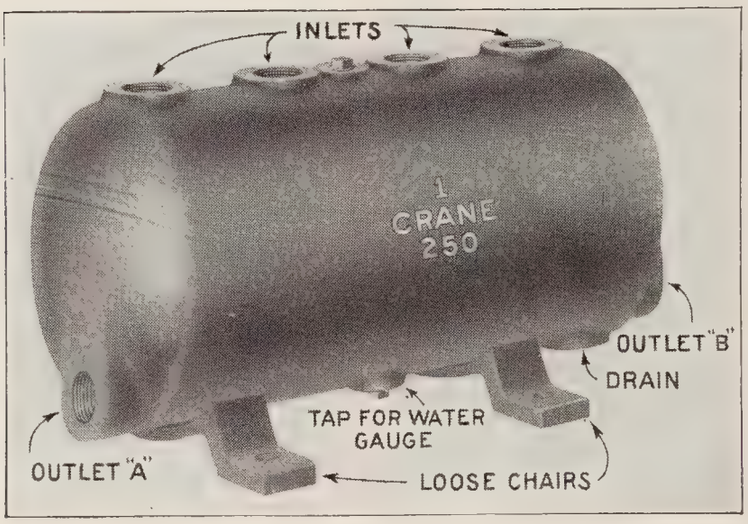
By their use the Spring Loaded Relief Valve is eliminated.

Cranetilt Three Valve Traps give excellent service on returns of apparatus that has a varying pressure while in service, such as brewing kettles, vacuum pans, evaporators, jacketed cooking kettles, heating systems and a number of other steam consuming apparatus that have a low initial starting pressure and a high terminal pressure, and they will handle make-up water from open type feed water heaters.

Three Valve Traps render admirable service on dry kilns using exhaust steam during the day and live steam at night, and eliminate the troubles heretofore encountered when using Non-Return Traps on high pressure steam

CONDENSATION RECEIVERS
FOR USE WITH
STEAM TRAPS

FOR STEAM WORKING PRESSURES UP TO 250 POUNDS



CODE: EDUCANDATO

Sizes ¾-inch to 2½-inch, made of Malleable Iron.
Sizes 3-inch and 4-inch are made of Riveted Steel.

Receiver No.	List Price Complete with Loose Chairs as shown	Pipe Connections					Dimensions			Capacity	Approximate Shipping Weight
		Number of Inlets	Size of Inlet Connections	Size of Outlet Connection "A"	Size of Outlet Connection "B"	Size of Drain Connection	Extreme Length	Extreme Height	Outside Diameter		
			Inches	Inches	Inches	Inches	Inches	Inches	Inches	Gals.	Pounds
¾	22.00	4	¾	1¼	1	¾	21¼	11¾	9⅞	5½	80
1	28.00	4	1	1½	1¼	1	26¼	13½	11½	9	120
1¼	36.00	4	1¼	2	1½	1¼	30	15⅛	13⅛	13¼	190
1½	50.00	4	1½	2½	2	1½	34	16¼	14⅛	18	250
2	70.00	4	2	3	2½	2	39	18⅝	16⅜	28	360
2½	100.00	4	2½	3½	3	2½	45	21	18½	42	510
*3	240.00	4	2½	4	2½		56	24¾	20½	72	525
*4	330.00	4	2½	5	2½		62	30¼	24¾	114	825

*Outlets "A" and "B" are on the bottom, instead of the ends of the receiver.

It is good practice to have one trap for each individual drain. There are times, however, when it is desired to have one trap handle several drips; at such time to aid in balancing up the pressures on drip lines, a receiver should be used, and on each drip line just before it enters the receiver, a check valve should be installed.

Receivers serve the following purposes: 1st, a water seal allowing only a solid body of water to flow to the trap; and 2nd, a storage reservoir of large capacity to take care of irregular volumes of condensation.

In selecting the proper size of receiver for use with a Direct Return Trap, the size of the receiver is determined by the pipe size of the trap. For example, a 1-inch No. 92 Direct Return Trap would require a No. 1 Receiver.

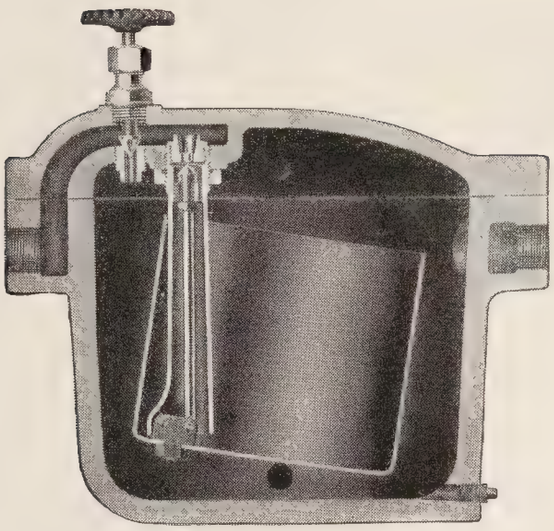
CRANE OPEN-FLOAT STEAM TRAPS

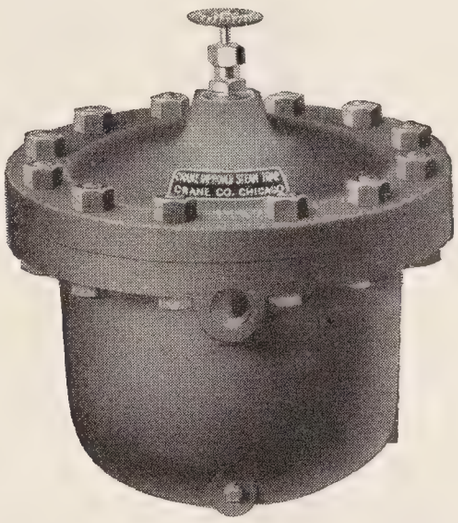
LOW PRESSURE, FOR STEAM PRESSURES UP TO 25 POUNDS
CODE: EDULCABANT

STANDARD, FOR STEAM PRESSURES FROM 26 TO 125 POUNDS
CODE: EDUQUERONT

HIGH PRESSURE, FOR STEAM PRESSURES FROM 126 TO 200 POUNDS
CODE: EFAUFILA

FOR TRAPS FOR MARINE SERVICE, PRESSURES UP TO 250 POUNDS, SEE OUR CATALOGUE No. 4500





Size No.	Size Inlet and Outlet Inches	Size Inlet and Outlet Millimeters	Price Each	Capacity		Largest Outside Diameter Inches	Height Over All Inches
				Lin. Feet of One In. Pipe	Sq. Feet of Radiating Surface		
1	$\frac{3}{4}$	19	25.00	4000	1333	$10\frac{1}{2}$	10
2	1	25	35.00	6000	2000	$14\frac{3}{4}$	$14\frac{1}{4}$
3	$1\frac{1}{4}$	32	45.00	10,000	3333	$17\frac{1}{2}$	$16\frac{1}{2}$
4	$1\frac{1}{2}$	38	60.00	15,000	5000	$19\frac{1}{2}$	18

Traps wanted for $\frac{1}{2}$ or $\frac{3}{8}$-inch connections, we will furnish bushings for $\frac{3}{4}$-inch (No. 1) trap without extra charge.

The capacities of these traps are based on ordinary or normal conditions, and will vary according to the service, pressure and exposure of the system to be drained.

In the inlet pipe close to the trap, we recommend the installation of one of our sediment separators, as shown on page 273.

OPERATION OF TRAP

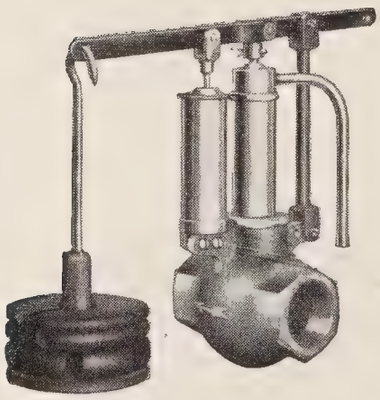
When open float traps are put in service the operation is as follows: Condensation entering the trap fills the space surrounding the bucket shaped float, which by its buoyancy lifts the valve to its seat. As condensation continues to flow, the water rises until it flows over the edge of the float, filling it until it sinks. This opens the trap valve and the pressure of the condensation forces the water from the float out through the valve and the buoyancy of the float again closes the valve. With suitable allowance for friction, water from a trap will discharge from the trap to a height equal to two feet for every pound per square inch of pressure in the trap.

IN STARTING, THE BY-PASS VALVE SHOULD BE KEPT OPEN UNTIL THE TRAP IS RELIEVED OF AIR

WHEN ORDERING, ALWAYS SPECIFY WHETHER LOW PRESSURE, STANDARD OR HIGH PRESSURE TRAPS ARE REQUIRED

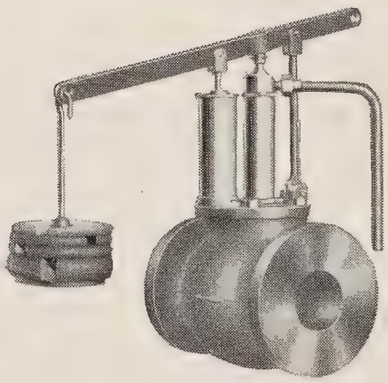
PRESSURE REDUCING VALVES

FOR SATURATED STEAM, ALSO WATER OR AIR WHEN SO SPECIFIED



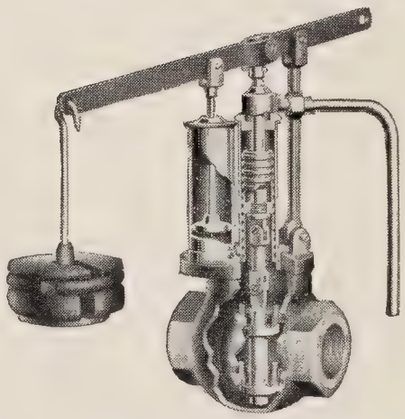
No. 972 SCREWED

CODE: EFEMINANDO

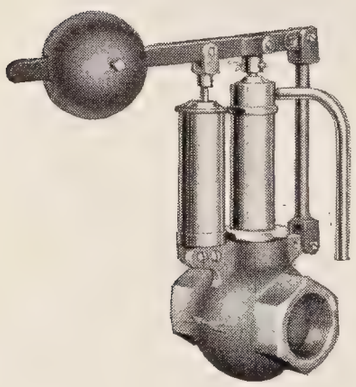


No. 972 FLANGED

CODE: EFUNDIRAS

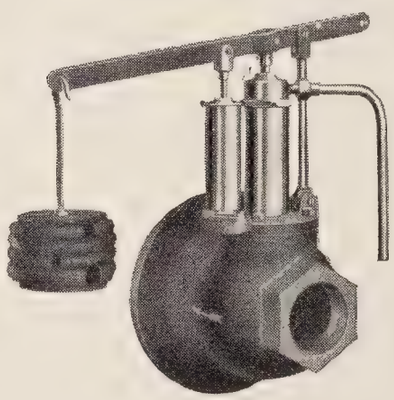


INTERIOR VIEW OF No. 972



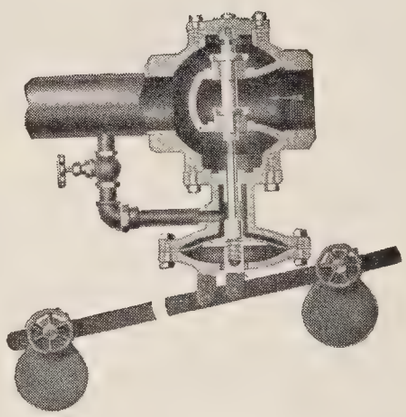
No. 974 SCREWED MARINE TYPE

CODE: EJEMPLARIA



No. 973 INLET, SCREWED OUTLET, FLANGED

CODE: EGREJOLA



No. 975 SCREWED LOW PRESSURE TYPE

CODE: EKDEMITE

No. 972 PRESSURE REDUCING VALVES are for general service. An oil dashpot is included to prevent vibration or chattering when the demand for steam varies suddenly or when the reduced pressure may be influenced by pulsation, as exhaust from an engine or pump.

No. 973 PRESSURE REDUCING VALVES have Expanded Outlet, allowing steam to expand quickly and decrease in velocity. These Valves are especially adapted to conditions requiring large volumes of steam, reduced noiselessly from comparatively high to very low pressures for steam heating and other purposes.

No. 974 PRESSURE REDUCING VALVES (MARINE TYPE) have sliding ball weights with set screws, instead of loose weights, and are especially adapted for marine service.

SAFE WORKING PRESSURES; All standard valves are suitable for inlet pressures up to 125 pounds (steam). All extra heavy flanged valves are suitable for inlet pressures up to 250 pounds. These inlet pressure limits also cover the pressure limit of the outlet end of a valve, except that the pressure limit on the No. 975 and No. 975½ types depend upon the strength of the diaphragm used.

No. 975 LOW PRESSURE REDUCING VALVES are principally used for steam heating purposes and intended for low pressure or vacuum heating systems only. Their operation is sensitive and positive and is governed entirely by the pressure existing in the low pressure main, which acts directly on the diaphragm, by means of the small size pipe connection. The lever is fitted with an adjustable regulating weight on each end. These Pressure Reducing Valves are also furnished in the Expanded Outlet type, No. 975½.

PRESSURE REDUCING VALVES

FOR SATURATED STEAM, ALSO WATER OR AIR WHEN SO SPECIFIED

Size	Nos. 972 and 974			No. 975			Size	No. 975 ½ Expanded			No. 973 Expanded		
	Screwed	Std. Flanged	Extra Heavy Flanged	Screwed	Std. Flanged	Extra Heavy Flanged		Screwed	Std. Flanged	Extra Heavy Flanged	Screwed	Std. Flanged	Extra Heavy Flanged
Inches	Each	Each	Each	Each	Each	Each	Inches	Each	Each	Each	Each	Each	Each
½	45.00			45.00			1x2	55.00			55.00		
¾	45.00			45.00			1 ¼x2 ½	60.00			60.00		
1	50.00			50.00			1 ½x3	70.00	75.00	80.00	70.00	75.00	80.00
1 ¼	55.00			55.00			2x4	85.00	90.00	95.00	85.00	90.00	95.00
1 ½	60.00			60.00			2 ½x5	100.00	105.00	110.00	100.00	105.00	110.00
2	70.00	75.00	80.00	70.00	75.00	80.00	3x6	125.00	130 00	135.00	125.00	130.00	135.00
2 ½	85.00	90.00	95.00	85.00	90.00	95.00	4x8		175.00	185.00		200.00	210.00
3	100 00	105 00	110.00	100.00	105.00	110.00	5x10		250.00	265.00		300.00	315.00
3 ½	120.00	125.00	130.00	120.00	125.00	130.00	6x12		350.00	365.00		425.00	440.00
4	140.00	145.00	150.00	140.00	145.00	150.00	8x16		500.00	525.00		600.00	625.00
5	170.00	175.00	185.00	170.00	175.00	185.00	10x20		650.00	675.00		800.00	825.00
6	220.00	225.00	235.00	195.00	200.00	210.00	12x24		850.00	960.00		1000.00	1050.00
7		300.00	325.00		250.00	275.00							
8		375.00	400.00		325.00	350.00							
10		575.00	600.00		400.00	425.00							
12		825.00	850.00		600.00	625.00							
14		1025.00	1075.00		800.00	850.00							

Sizes of Expanded Outlet Valves No. 973 and No. 975½ not listed, prices on application.

Any of the above Valves can be furnished with Cast Steel Bodies, Monel Metal trimmed, prices on application.

No. 972, No. 974 and No. 975 in sizes 1½-inch and under are made with bronze bodies and screwed ends only, sizes 2-inch to 6-inch inclusive, are iron bodies with either screwed or flanged ends and sizes 7-inch and larger are flanged ends only.

Unless otherwise specified, No. 972 and No. 975 Valves up to and including 6-inch size, will be furnished with screwed ends, while the No. 974 (Marine Type) will be furnished flanged ends in sizes 2-inch and above, and the smaller sizes will be furnished with screwed ends.

No. 973 and No. 975½ Valves in sizes 1½ x 3 to 3 x 6 inclusive, are made in three styles of ends as follows:

Both ends screwed, both ends flanged, inlet screwed and outlet flanged. Unless otherwise specified these sizes will be furnished with inlet screwed and outlet flanged but will carry the same list price as both ends flanged.

When flanged valves are ordered for pressures above 125 pounds, we will furnish them made extra heavy with extra heavy flanges.

When working pressure is not specified on orders for flanged valves, we will furnish valves suitable for 125 pounds pressure. Both standard and extra heavy valves are shipped faced and drilled, and at no additional charge for drilling. Companion flanges are extra and only furnished when ordered.

When Ordering: Please state size and catalogue number, whether screwed or flanged; also give boiler pressure and pressure desired on reduced side; state what purpose Pressure Reducing Valves are for, and whether they are to be used on steam, air or water.

Templates for drilling valves with Standard diameter flanges, page 596.
Templates for drilling valves with Extra Heavy diameter flanges, page 598.

PRESSURE REGULATORS

FOR STEAM AND AIR

The prevailing use of high pressures and the increase in the number of industrial processes using steam and air have greatly increased the need for automatic devices which will reduce and properly regulate steam and air pressures. Not all power apparatus is adapted for the high pressures so common today, nor is it economical to use a pressure higher than that required to do the work, and steam for heating systems is often taken from high pressure power boilers.

Wherever it is necessary or desirable to reduce the pressure of steam or air, a Crane Pressure Regulator should be used because they are designed particularly to give accurate automatic pressure regulation. Our regulators are recommended because they possess the following features: Reliability, wide range of variation in reduced pressure, simplicity of operation, accessibility for inspection, convenience in making repairs.

All Crane Pressure Regulators are made for any initial working pressure of air or saturated steam up to 250 pounds. They may also be used with superheated steam for a total temperature not to exceed 500 degrees Fahrenheit.

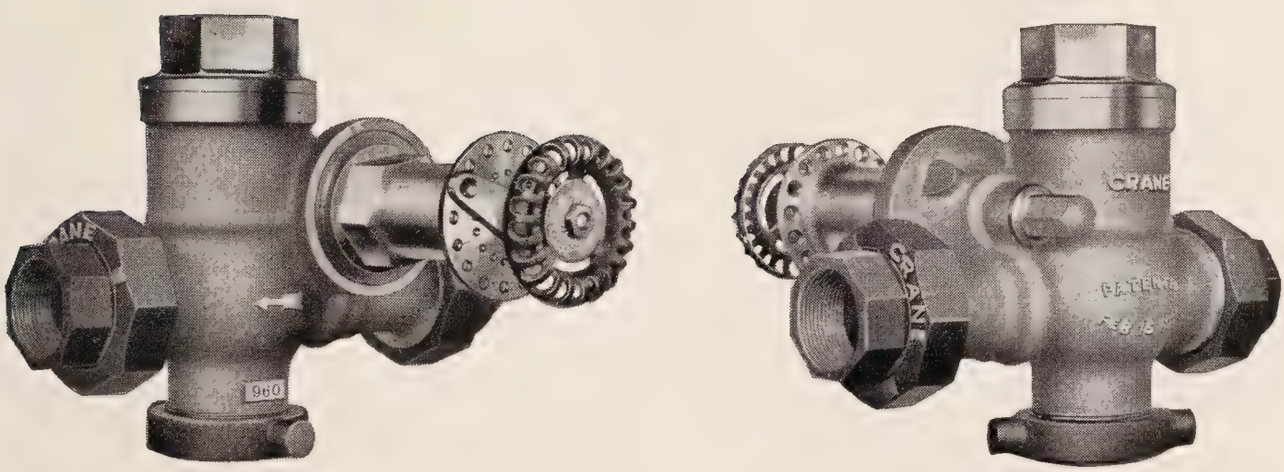
One pressure regulator will perform the entire reduction regardless of the difference between initial and reduced pressures provided a regulator of the proper capacity is used.

Crane Pressure Regulators are adapted for use with steam heating systems vulcanizers, cookers, paper machines, engines, pumps, turbines, dryers, various industrial processes, air tools, blasts, heaters of various kinds, etc.

PRESSURE REGULATORS

FOR SATURATED STEAM OR AIR WORKING PRESSURES
UP TO 250 POUNDS

FOR SUPERHEATED STEAM WORKING PRESSURES HAVING A TOTAL TEMPERATURE NOT HIGHER THAN 500 DEGREES FAHRENHEIT



No. 960

CODE: ELITROPIA

Size.....Inches	½	¾	1	1¼	1½	2
Size.....Millimeters	13	19	25	32	38	50
No. 960.....Each	43.00	48.00	54.00	67.00	83.00	104.00

Regulators are furnished with the pilot valve on the left hand side facing the inlet.

These Valves all have union connections.

These Valves regularly are furnished with provision for locking the spring case.

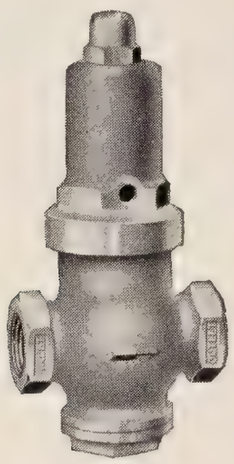
For general dimensions, see page 631.

WATER PRESSURE REGULATOR

(ALSO ADAPTABLE FOR AIR SERVICE)

CAPABLE OF REDUCING 300 POUNDS INITIAL PRESSURE TO A DELIVERY OF FROM 10 TO 100 POUNDS PER SQUARE INCH

SIZES 2-INCH AND SMALLER HAVE BRASS BODY
SIZES 2½-INCH AND LARGER HAVE IRON BODY



SCREWED
CODE: ELKESAITE

Size . . . . . Inches	½	¾	1	1¼	1½	2	2½	3	3½
Size . . . . . Millimeters	13	19	25	32	38	50	64	76	90
Screwed . . . . . Each	20.00	21.00	22.00	27.00	35.00	44.00	60.00	77.00	90.00
Flanged . . . . . Each	22.00	23.00	24.00	30.00	37.00	47.00	65.00	82.00	95.00
Face to Face, Flanged . .	4½	4½	5	5	5½	6½	10	10½	11½
End to End, Screwed . .	3⅜	3⅜	4	4⅝	4⅞	6⅛	8½	9¾	10¾
Diameter of Flanges . . .	3½	3¾	4	4½	5	6	7½	8¼	9
Thickness of Flange . . .	7/16	7/16	½	½	9/16	9/16	1	1⅛	1 3/16
Center to Bottom	2⅛	2⅛	2¼	2⅝	2¾	3	5¼	6	6½
Center to Top	6¼	6¼	6½	6¾	7⅝	9⅛	10½	10⅞	11¼
Length Over All	8⅜	8⅜	8¾	9⅜	10⅜	12⅛	15¾	16⅞	17¾
Size . . . . . Inches	4	4½	5	6	7	8	9	10	12
Size . . . . . Millimeters	100	113	125	150	175	200	225	250	300
Screwed . . . . . Each	110.00								
Flanged . . . . . Each	115.00	130.00	148.00	190.00	250.00	310.00	400.00	520.00	675.00
Face to Face, Flanged . .	12½	14	15	17	18¼	20¾	23	23½	27¼
End to End, Screwed . .	11½	12½	13¾	14½					
Diameter of Flanges . . .	10	10½	11	12½	14	15	16¼	17½	20½
Thickness of Flanges . .	1¼	1 5/16	1⅜	1 7/16	1½	1⅝	1¾	1⅞	2
Center to Bottom	6⅝	7⅛	7½	8⅝	10¾	11½	12¼	12⅝	15
Center to Top	16⅞	17½	17⅝	22	23¾	27¾	28½	29¼	32
Length Over All	23½	24⅝	25⅛	30⅝	34½	38¼	40¾	41⅞	47

This regulator is of the reliable self contained type, especially adapted for installations where high and at times, variable initial or inlet pressures are maintained and a constant service pressure (low pressure) is desired. It can be installed in any position, and can be recommended wherever a steady, even delivery is required, whether service lines (low pressure) are open or closed. Internal parts are readily accessible for repair by unscrewing spring chamber, removing the bottom plug, holding the main valve from turning, and then unscrewing the piston follower.

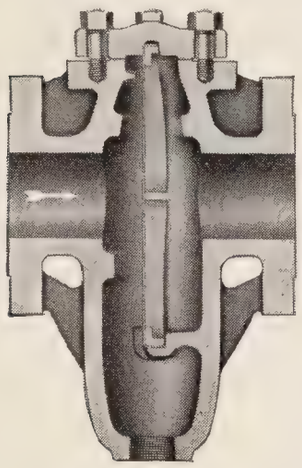
EXTRA HEAVY

SEDIMENT SEPARATORS

FOR STEAM WORKING PRESSURES UP TO 250 POUNDS
SCREWED OR FLANGED ENDS

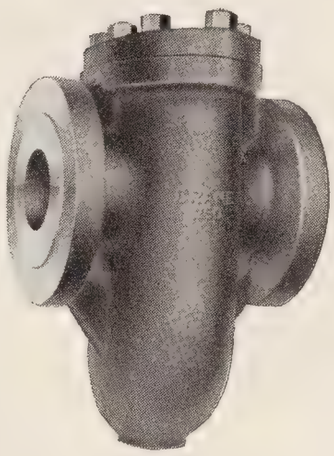
SIZES ½ TO 4½-INCH, IRON BODY
SIZES 5-INCH AND LARGER, FERROSTEEL

FOR SUPERHEATED STEAM RATING OF FERROSTEEL, SEE PAGE 435



No. 988 SCREWED
CODE: ELUCUBRADO

No. 989 FLANGED
CODE: ELUGENTOR



Size		Price List		Dimensions						
Inches	Millimeters	Screwed No. 988 Each	Flanged No. 989 Each	Face to Face Flanged	Diameter of Flanges	Thickness of Flanges	End to End Screwed	Center Line to Bottom	Top to Bottom Overall	Size of Drain Connection
½	13	4.00					3	3 1/8	5 1/4	½
¾	19	5.00					3 1/2	4 1/16	6 11/16	¾
1	25	6.50					3 1/2	4	7	¾
1¼	32	8.00					3 3/4	4 5/8	8 1/8	1
1½	38	11.00					4	5 1/4	9 1/8	1
2	50	17.00					4 1/2	6 1/2	11 1/4	1
2½	64	21.00	33.00	8 1/2	7 1/2	1	5 3/8	8	13 3/4	1¼
3	76	28.00	43.00	10	8 1/4	1 1/8	6	9 1/4	15 3/4	1¼
3½	90		65.00	11	9	1 3/16		10 1/2	18	1¼
4	100		80.00	12 1/4	10	1¼		11 13/16	20 3/16	1¼
4½	113		110.00	13 1/2	10 1/2	1 5/16		13 1/8	22 1/2	1¼
5	125		125.00	14 3/4	11	1 3/8		14 1/4	24 1/4	1½
6	150		165.00	17 1/4	12 1/4	1 7/16		17	28 3/4	1½
8	200		230.00	22	15	1 5/8		21 7/8	37 1/8	2

These separators are carefully designed and substantially constructed, and not only prevent the passage of foreign substances but also furnish a means of removing them, thus keeping the pipe line clean. The design is such that the area in the body is exceptionally large, permitting the use of small perforations in the screen.

Unless otherwise specified, Crane Sediment Separators will be furnished with brass screens having perforations 1/16-inch in diameter, making them suitable for use with steam, water and medium or heavy oils. We are also prepared to furnish brass screens having perforations 1/32-inch or 1/64-inch in diameter where service conditions require special screens.

An extra charge is made for drilling end flanges.

Templates for Drilling, Page 598.

Price List for Drilling, Page 484.

CAST STEEL

SPECIAL SEDIMENT SEPARATORS

FOR ALL PRESSURES

Prices and Dimensions on application.

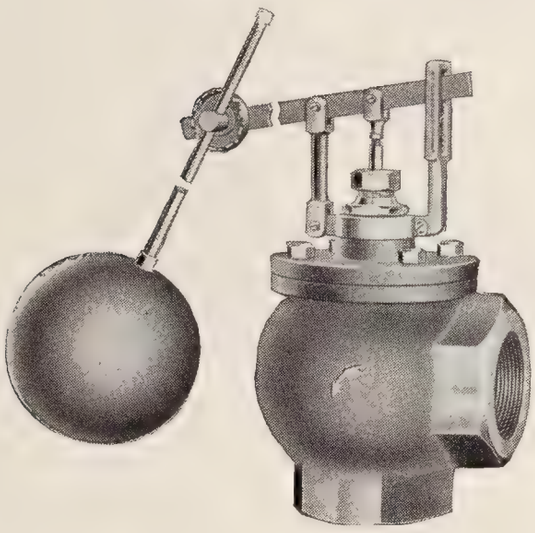
When ordering or requesting prices, specify size and working pressure, also whether screwed or flanged.

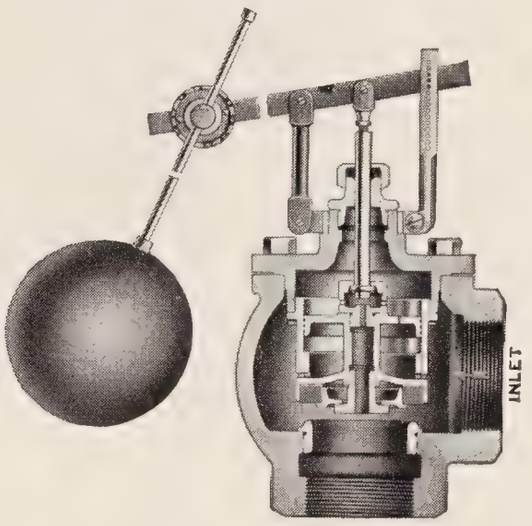
SINGLE SEATED FLOAT VALVE

AUXILIARY OPERATED **MADE ANGLE TYPE ONLY**

FOR WORKING PRESSURES UP TO 200 POUNDS AND FOR WATER AT ANY TEMPERATURE

SIZES ¾-INCH TO 1½-INCH INCLUSIVE, ALL BRONZE.
SIZES 2-INCH TO 8-INCH INCLUSIVE, IRON BODIES, BRONZE TRIMMINGS





No. 997
CODE: ELUTISSIMO

Size.....Inches	¾	1	1¼	1½	2	2½
Size.....Millimeters	19	25	32	38	50	64
Price.....Each	30.00	32.00	35.00	40.00	50.00	70.00
Size.....Inches	3	4	5	6	8	
Size.....Millimeters	76	100	125	150	175	
Price.....Each	90.00	130.00	160.00	200.00	400.00	
Diameter of Flanges.....Inches					13½	

Sizes ¾-inch to 6-inch inclusive, screwed ends only.
8-inch size made flanged, ends only. Regularly shipped faced and drilled. Above prices include facing and drilling.

SERVICE

This is a single seated auxiliary operated angle float valve with seat area equal to the pipe size. It is used to maintain a constant water level in an open tank. WHEN CLOSED, IT IS TIGHT AND NO LEAKAGE WILL OCCUR.

The auxiliary valve is loosely connected to the main valve with the result that the weight of the float aids the supply pressure in opening the main valve, this being an important advantage when the supply pressure is very low. All sizes include the gland and stuffing box shown in illustration, thus avoiding leakage past the auxiliary valve stem. The swivel guide yoke allows the float to be located in any desired position.

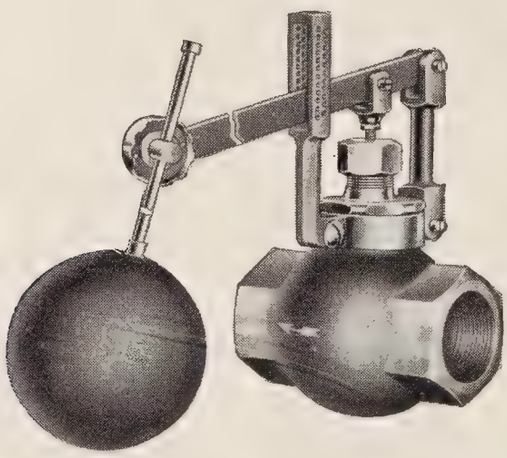
OPERATION

The auxiliary valve is held open by the float lever when the water line is below the float. At this time, the supply pressure entering the inlet will exert a lifting power on the bottom of the piston and hold the main valve open, the flow of water continuing until the float rises and closes the auxiliary valve. Closing the auxiliary valve allows water to pass the piston which is loosely fitted in cylinder, thus allowing the supply pressure to equalize on both sides of the piston, and the continued rise of the float will cause the auxiliary valve to move the main valve to its seat. As the water level in the tank lowers, the auxiliary valve will be opened by the float and the pressure in the cylinder above the piston will be vented to the atmosphere through the port extending through the main valve and piston, thus allowing the supply pressure to become effective on the lower side of the piston when the main valve will again be opened.

BALANCED

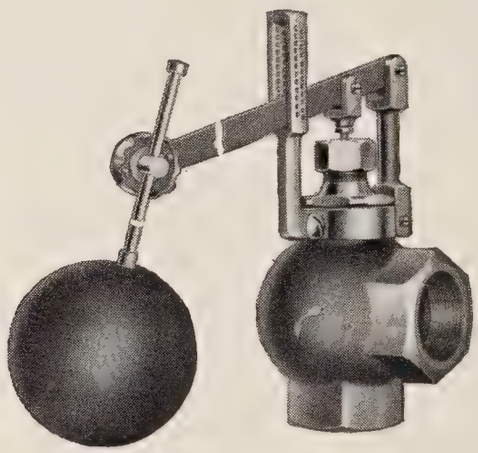
TANK FLOAT VALVES

SUITABLE FOR COLD WATER WORKING PRESSURES UP TO 200 POUNDS



No. 995 GLOBE

CODE: EMBRASATES



No. 993 ANGLE

CODE: EMBRONCHAS

Size Inches	Size Milli-meters	Price Globe or Angle Each	Diameter of Copper Float Inches	Diameter of Flanges Inches	End to End Screwed End Globe Inches	Face to Face Flanged End Globe Inches	Center to End Screwed Angle Inches	Center to End Flanged Angle Inches
3/8 and 1/2	10 and 13	29.00	7		3 3/4		1 7/8	
3/4	19	29.00	7		3 7/8		1 15/16	
1	25	35.00	7		4 1/8		2 1/16	
1 1/4	32	37.00	7		4 1/4		2 1/8	
1 1/2	38	43.00	7		4 7/8		2 7/16	
2	50	51.00	7	6	6 7/8	7 1/2	3 7/16	4 1/8
2 1/2	64	67.00	8	7	8	9	4	4 3/4
3	76	83.00	8	7 1/2	9 1/8	9 3/4	4 9/16	5 1/4
3 1/2	90	96.00	8	8 1/2	9 3/8	10 1/8	4 15/16	5 5/16
4	100	112.00	8	9	9 7/8	10 5/8	4 15/16	6 1/8
4 1/2	113	133.00	10	9 1/4	11 1/4	11 1/2	5 5/8	6 1/8
5	125	144.00	10	10	11 1/4	12 1/8	5 5/8	6 3/8
6	150	170.00	10	11	12 1/4	13	6 1/8	6 7/8
7	175	202.00	10	12 1/2		14 5/8		7 7/8
8	200	229.00	10	13 1/2		16 1/4		8 5/8
10	250	293.00	12	16		20 1/4		10 1/4
12	300	400.00	12	19		22 5/8		11 7/8

The above prices are for either globe or angle types, complete with float and levers as shown. Sizes 14, 16, 18 and 20-inch can also be furnished. Globe Type only.

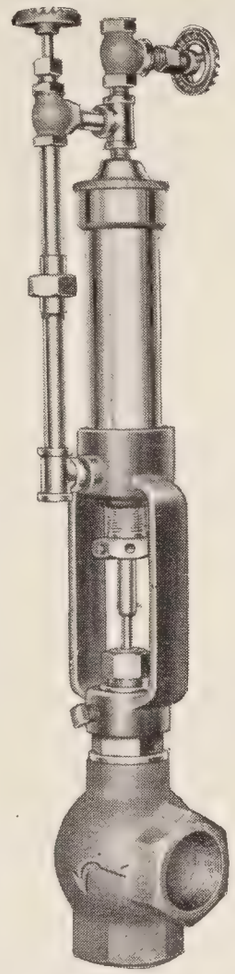
Sizes 1½-inch and smaller are made all bronze screwed ends only. Size 2-inch can be furnished all bronze at an extra price. Sizes 2 to 6-inch, inclusive, are made with iron bodies with bronze discs and seats and can be furnished either screwed or flanged ends, but screwed ends will be shipped if flanged ends are not specified. Sizes 7-inch and larger are made flanged ends only. Above prices includes facing and drilling flanged valves. Flanged valves are regularly shipped faced and drilled. Companion flanges are extra and only furnished when ordered.

When ordering, please specify globe or angle type and state whether for hot or cold water and whether screwed or flanged ends are required. If for hot water, specify temperature in degrees Fahr.

We can furnish valves for higher water working pressure than 200 pounds at a special price.

IMPROVED PUMP GOVERNOR

MADE IN TWO PATTERNS, STANDARD AND EXTRA HEAVY.
THE STANDARD FOR SATURATED STEAM PRESSURES UP TO 125 POUNDS.
THE EXTRA HEAVY FOR SATURATED STEAM PRESSURES UP TO 250 POUNDS.
BOTH ARE SUITABLE FOR CONTROLLING WATER PRESSURES OF 5 POUNDS TO 500 POUNDS.
FOR HIGHER PRESSURES AND SUPERHEATED STEAM REQUIREMENTS WE CAN SUPPLY GOVERNORS WITH CAST STEEL BODIES, MONEL METAL MOUNTED.
PRICE LIST COVERS STANDARD GOVERNORS ONLY.
EXTRA HEAVY AND CAST STEEL, PRICES ON APPLICATION.

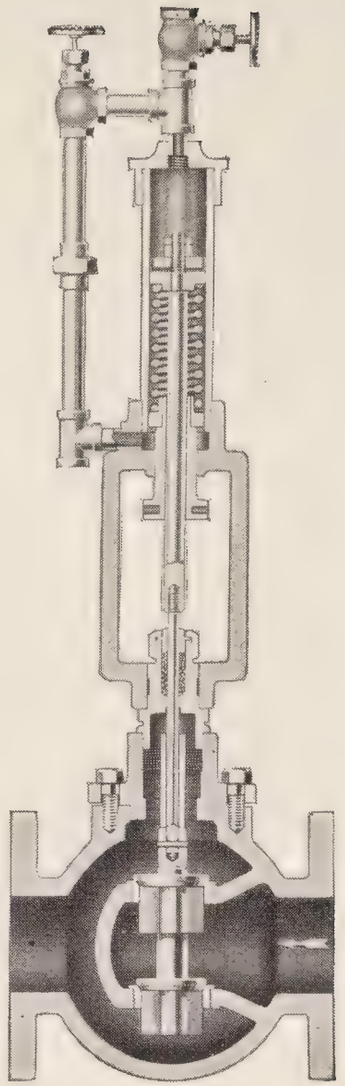


No. 998. ANGLE SCREWED
CODE: EMBUFFLER

This governor is designed to automatically control the action of any type of steam pump so as to maintain the water discharge at a constant pressure. It will prevent the accumulation of excessive pressure, or any pressure variations exceeding a pound or two. This is a simple, direct acting governor and can be adjusted while pump is operating. Inner valve and seats are bronze with Monel metal stems. Flanged governors are furnished with standard flanges and drilling, unless otherwise specified. No charge is made for drilling.

Size Inches	PRICE		Center to Face or Center to Bottom—Inches			Face to Face—Inches			Center to Top Inches	Shipping Weights, Lbs.	
	Angle or Globe		Angle Type			Globe Type			Globe or Angle Type		
	Screwed	Flanged	Scrd.	Std. Flgd.	Ex. Hy. Flgd.	Scrd.	Std. Flgd.	Ex. Hy. Flgd.		Std. Scrd.	Std. Flgd.
3/8–3/4	$ 54.00	.....	1 15/16	.....	.....	3 7/8	.....	.....	19 1/2	25	.....
1	58.00	.....	2 1/16	.....	.....	4 1/8	.....	.....	19 3/4	26	.....
1 1/4	68.00	.....	2 1/8	.....	.....	4 1/4	.....	.....	20 1/2	27	.....
1 1/2	83.00	.....	2 7/16	.....	.....	4 7/8	.....	.....	20 3/4	28	.....
2	93.00	$ 97.00	3 7/16	4 1/8	4 3/8	6 7/8	7 1/2	8	22 7/8	48	56
2 1/2	112.00	116.00	4	4 3/4	5 1/16	8	9	9 5/8	23 1/2	60	71
3	136.00	145.00	4 9/16	5 1/4	5 5/8	9 1/8	9 3/4	10 1/2	23 3/4	77	90
3 1/2	161.00	170.00	4 15/16	5 5/16	5 11/16	9 3/8	10 1/8	10 7/8	24	88	102
4	185.00	194.00	4 15/16	6 1/8	6 7/16	9 7/8	10 5/8	11 1/4	24 5/8	96	118
4 1/2	210.00	220.00	5 5/8	6 1/8	6 1/2	11 1/4	11 1/2	12 1/4	25 1/2	118	142
5	233.00	242.00	5 5/8	6 5/8	7 1/16	11 1/4	12 1/8	12 3/4	26	141	165
6	280.00	290.00	6 1/8	6 7/8	7 5/16	12 1/4	13	13 7/8	27	170	198
7	.....	364.00	.....	7 7/8	8 5/16	.....	14 5/8	15 5/8	29 1/2	.....	254
8	.....	436.00	.....	8 5/8	9 1/8	.....	16 1/4	17 1/4	30 3/4	.....	314

When Ordering: Please state steam and water discharge pressures, globe or angle bodies, screwed or flanged ends. Sizes 1½-inch and under are made with brass bodies and screwed ends only; sizes 2-inch to 6-inch, inclusive, are made with iron bodies and either both ends screwed or both ends flanged. Both ends screwed will be shipped unless ordered flanged; sizes 7-inch and larger are iron bodies with flanged ends only. Companion flanges are extra and only furnished when ordered. Angle type will always be shipped unless globe type is specified.



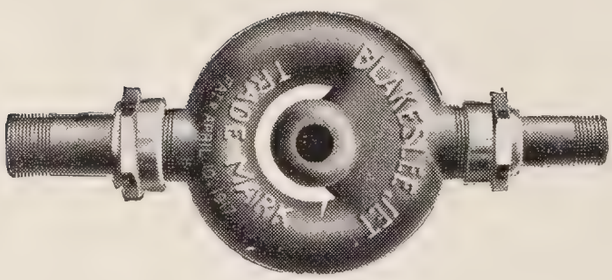
No. 999. GLOBE FLANGED
CODE: EMETTEVATE

BLAKESLEE'S

STEAM JET PUMPS

OR EJECTORS

SUCTION



DISCHARGE

CODE: EMIPLEGICO

Size of Pump Inches	Suction Pipe Inches	Discharge Pipe Inches	Steam Pipe Inches	Steam Opening	Capacity Per Minute Gallons	Price Each
3/4	3/4	1/2	3/8	3/16	8	8.00
1	1	3/4	1/2	4/16	15	10.00
1 1/4	1 1/4	1	1/2	5/16	20	12.00
1 1/2	1 1/2	1 1/4	3/4	6/16	30	14.00
2	2	1 1/2	3/4	7/16	40	16.00
2 1/2	2 1/2	2	1	8/16	50	20.00
3	3	2 1/2	1	9/16	60	24.00

The above capacities are based on 50 pound steam pressure.

The limit of perpendicular suction is 14 feet and will require steam pressure of 25 pounds or above.

Special Pumps furnished for higher suction power.

Liquids may be forced to an elevation equal to about one foot to each pound steam pressure. We, however, recommend two Pumps, one placed above the other for elevations above 50 feet.

These Pumps will work in any position.

THE PENBERTHY EJECTOR

SYPHON OR STEAM JET PUMP

LIFTS 22 TO 25 FEET ELEVATES 50 TO 75 FEET
"XL-96"

CODE: EMITIGATIS

Order by Size	Price All Brass	Price Iron Body; Brass Jets	Pipe Connections				Capacity per Hour			
			Steam		Suction and Delivery		40 to 65 Lbs. Steam 3 ft. Lift	20 to 40 Lbs., or 65 to 100 Lbs.	40 to 65 Lbs. 50 feet Eleva'n	40 to 65 Lbs. 25 feet Elevat'n
No.	Each	Each	Ins.	Millimeters	Ins.	Millimeters	Gallons	Gallons	Gallons	Gallons
1	8.00	Sizes 1 to	3/8	10	1/2	13	240	235	120	180
2	10.00	4 made in	1/2	13	3/4	19	500	450	250	375
3	15.00	All Brass	3/4	19	1	25	840	700	420	625
4	20.00	only	1	25	1 1/4	32	1,350	1,300	650	950
5	25.00	20.00	1	25	1 1/2	38	1,950	1,850	975	1,450
6	35.00	27.50	1 1/4	32	2	50	3,500	3,000	1,750	2,600
7*	50.00	40.00	1 1/2	38	2 1/2	64	5,700	4,350	2,500	3,750
8*	70.00	50.00	2	50	3	75	9,500	8,160	4,750	7,200
9*	105.00	70.00	2	50	3 1/2	90	13,600	12,400	6,800	10,200
10*	145.00	95.00	2 1/2	64	4	100	18,400	17,100	9,200	13,800

Sizes 5 and 6 will be furnished of brass unless ordered of iron.

*Unless ordered in brass, sizes 7 to 9, inclusive, will be shipped with iron body brass jets and steam connection, and size 10, all iron except jets. The jets in all sizes are made of a special hard metal, insuring good wearing qualities.

When a 1 inch Ejector is ordered we send No. 3, not No. 4, or 5, etc.

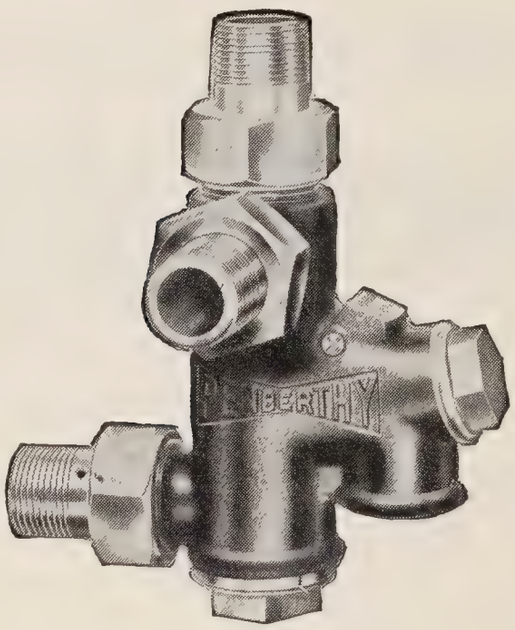
Strainers are not included in price of Ejectors.

PENBERTHY AUTOMATIC INJECTOR

STYLE LEFT AND BACK

TO START

Open full the globe valve in water supply first, and then globe valve in steam pipe. If water issues from overflow, throttle the water supply valve until discharge stops.



No. 47—STOCK INJECTOR

TO STOP

Close the steam valve. The water valve need not be closed unless the Injector is used as a non-lifter, or lift is considerable.

SUCTION LEFT—OVERFLOW FRONT—DISCHARGE BACK

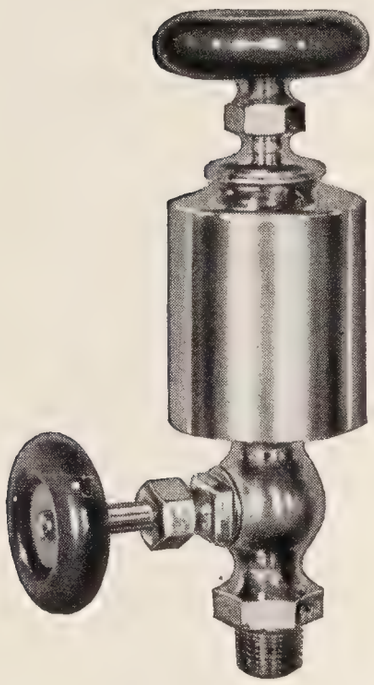
CODE: EMOLENTIUM

Order by Size No.	Price	Pipe Connections all around		Capacity per Hour 1 to 3 Feet Lift, 60 to 85 Pounds Steam Pressure		Nominal Horse-Power
		Inches	Millimeters	Maximum Gallons	Minimum Gallons	
O	15.00	¼	6	60	35	3 to 6
OO	16.00	⅜	10	80	45	4 to 8
A	18.00	½	13	135	70	8 to 16
AA	20.00	½	13	180	100	12 to 22
B	25.00	¾	19	260	140	17 to 32
BB	30.00	¾	19	360	180	20 to 45
C	40.00	1	25	475	250	40 to 65
CC	45.00	1	25	600	325	45 to 80
D	55.00	1¼	32	800	425	50 to 100
DD	60.00	1¼	32	1000	525	75 to 135
E	75.00	1½	38	1400	740	100 to 180
EE	90.00	1½	38	1900	850	115 to 255
F	110.00	2	50	2400	1275	160 to 320
FF	125.00	2	50	3000	1600	200 to 400
G	150.00	2½	64	3600	1875	300 to 500
GG	200.00	2½	64	4200	2150	375 to 600

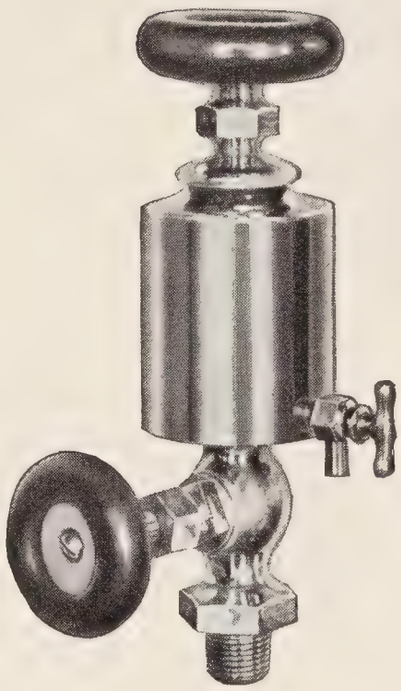
The capacity can be cut down about one-half by simply throttling the water supply Valve.

Where Injectors are ordered by size of pipe connections, we will always send the size having the largest capacity.

ENGINE LUBRICATORS



NO. 680



NO. 682

WITH AIR COCK AND TUBE

CODE: EMPANNERAS

CODE: EMPARFUMAT

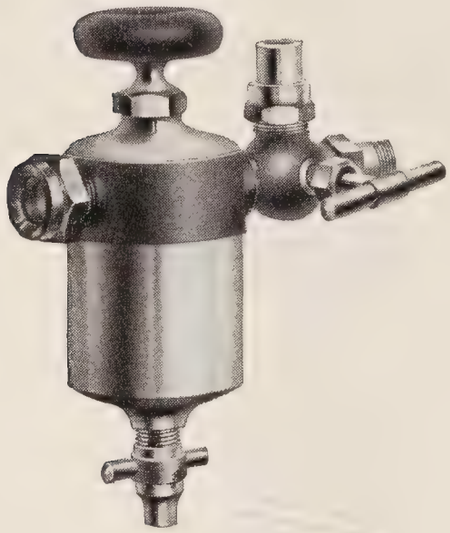
Diameter of Body	Inches	1	1¼	1½	1¾	2
Shank, Iron Pipe Thread		¼	⅜	⅜	½	½
No. 680	Each	2.00	2.20	2.40	2.60	2.90
No. 682, with Air Cock and Tube	Each		3.20	3.40	3.60	3.90
Diameter of Body	Inches	2¼	2½	3	3½	4
Shank, Iron Pipe Thread		½	½	¾	¾	¾
No. 680	Each	3.25	3.75	4.75	7.00	10.00
No. 682, with Air Cock and Tube	Each	4.25	4.75	5.75	8.00	11.00

The No. 682 Lubricator is so constructed that the flow of oil is regulated by condensation (it feeds as it condenses), which is a very important feature. The result of this slow feed is that it takes hours for the oil to pass through, instead of it running out in a short time.

We would therefore recommend consumers to use the Lubricator with Air Cock and Tube.

TO OPERATE

Fill with oil to top of inside tube and open valve when you commence to run. When the oil is exhausted open cock and let water out, then fill with oil again as before.



CODE: EMPATADERA

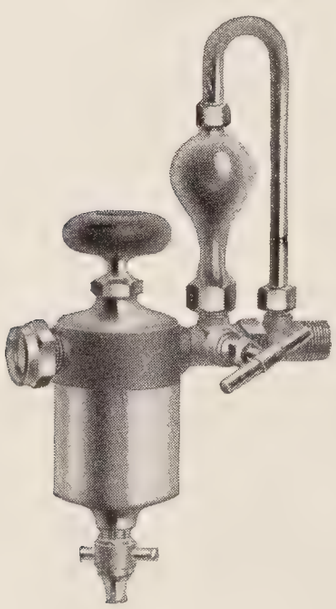
SWIFT
SIGHT FEED LUBRICATORS

DOUBLE CONNECTION

CLASS F

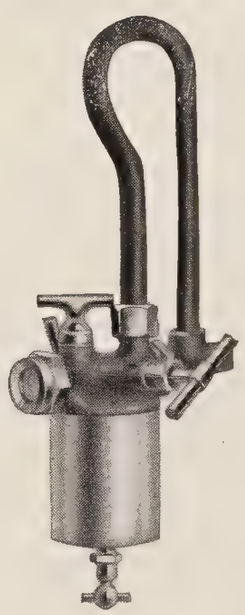
Capacity	¼ Pint	⅓ Pint	½ Pint	1 Pint	1½ Pint	1 Quart
Brass Finish.....Each	2.75	3.00	3.25	4.65	5.40	6.15
Nickel Plated.....Each	3.15	3.40	3.65	5.30	6.05	6.80
Pipe Thread.....Inches	⅜	⅜	⅜	½	½	½

SINGLE CONNECTION



CLASS F. S. C.

CODE: EMPOLARMOS



CLASS G

CODE: EMPORFLUG

CLASS F. S. C.

Capacity	¼ Pint	⅓ Pint	½ Pint	1 Pint	1½ Pint	1 Quart
Brass Finish.....Each	3.50	3.75	4.00	6.00	6.75	7.50
Nickel Plated.....Each	3.90	4.15	4.40	6.65	7.40	8.15
Pipe Thread.....Inches	⅜	⅜	⅜	½	½	½

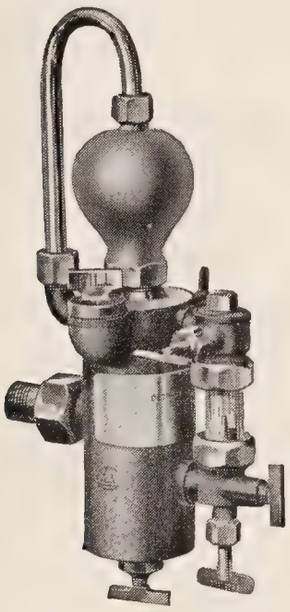
CLASS G

Capacity	¼ Pint	⅓ Pint	½ Pint
Brass Finish.....Each	2.15	2.50	2.90
Nickel Plated.....Each	2.50	2.85	3.25
Pipe Thread.....Inches	¼	⅜	⅜

ZERO SIGHT-FEED LUBRICATORS

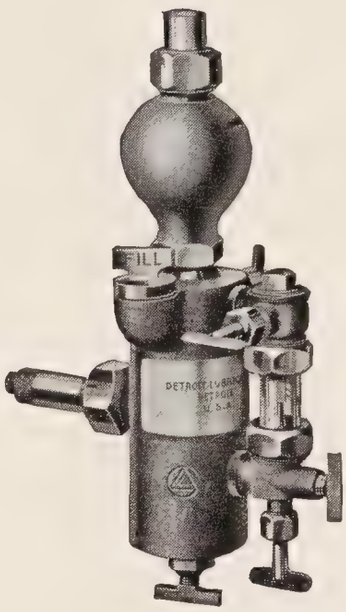
SINGLE OR DOUBLE CONNECTION

ESPECIALLY ADAPTED FOR STEAM ENGINES AND PUMPS LOCATED IN COLD OR EXPOSED POSITIONS



SINGLE CONNECTION

CODE: EMPORTASSE



DOUBLE CONNECTION

CODE: EMPOTRARLE

PRICE LIST—SINGLE CONNECTION

Size	¼ Pint	⅓ Pint	½ Pint	1 Pint	1 Quart
Bronzed Body, Finished Trimmings . Each	15.00	17.00	20.00	28.00	42.00
Nickel Plated all over . . . . . Each	18.00	20.00	23.00	32.00	47.00
Pipe Thread on Support Arm . . . . Inches	½	½	½	½	½

PRICE LIST—DOUBLE CONNECTION

Size	¼ Pint	⅓ Pint	½ Pint	1 Pint	1 Quart
Bronzed Body, Finished Trimmings . Each	15.00	17.00	20.00	28.00	42.00
Nickel Plated all over . . . . . Each	18.00	20.00	23.00	32.00	47.00
Pipe Thread on Support Arm . . . . Inches	⅜	⅜	⅜	½	½

THE ZERO LUBRICATOR possesses every feature necessary or desirable for traction engine service, or for engines working in exposed places, subject to sudden changes of temperature. It is also used quite extensively on steam pumps.

THE HEATING FEATURE. The oil in the Zero Cup is kept warm by steam. This heating arrangement is automatic; it requires no attention—gives no trouble—but no matter how cold the weather, the oil will continue warm while steam is supplied to the engine. The oil can not chill in this cup while the boiler is producing steam.

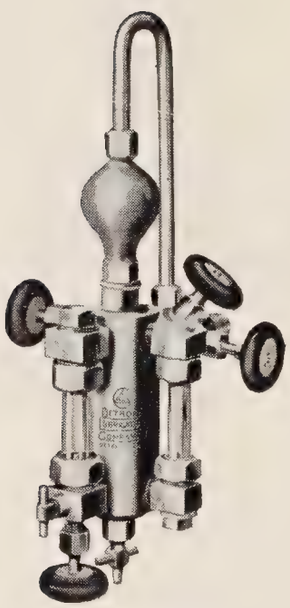
THE SINGLE CONNECTION LUBRICATOR may be attached to the steam pipe on either side of the throttle, or to the steam chest direct, by using an elbow and a short piece of pipe.

When ordering repair parts, it is absolutely necessary to state the size of Lubricator and the shop number, which is stamped on the body.

IMPROVED STANDARD

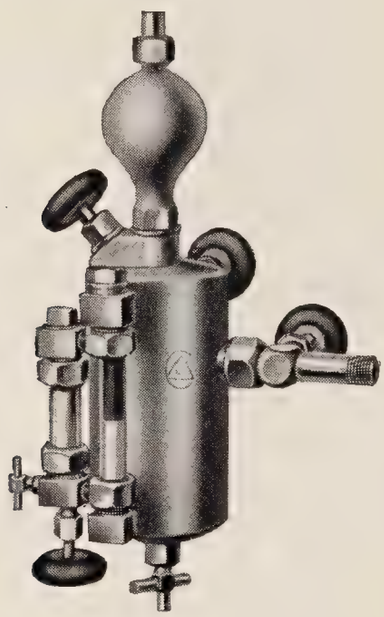
DETROIT SIGHT-FEED LUBRICATORS

FOR STATIONARY ENGINES



STYLE C
IMPROVED STANDARD
SINGLE CONNECTION

CODE: EMPOURPRAT



IMPROVED STANDARD
DOUBLE CONNECTION

CODE: EMPROSTATE

PRICE, SINGLE CONNECTION

Size		⅓ Pint	½ Pint	1 Pint	1 Quart
Brass Finish	Each	17.00	20.00	23.00	28.00
Nickel Plated	Each	20.00	23.00	26.00	30.00

PRICE, DOUBLE CONNECTION

Size		⅓ Pint	½ Pint	1 Pint	1 Quart	½ Gallon
For Cylinder		10 inch and under	10 to 12 inch	12 to 18 inch	18 to 30 inch	30 inch and over
Brass Finish	Each	17.00	22.00	30.00	45.00	60.00
Nickel Plated	Each	20.00	25.00	35.00	50.00	65.00

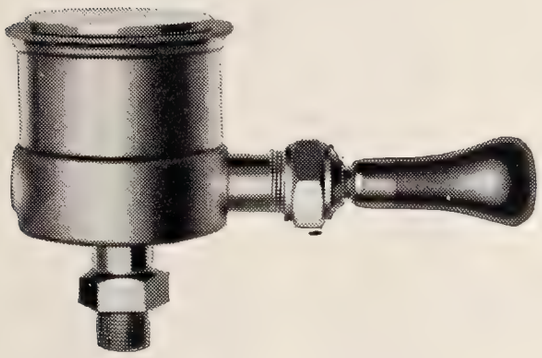
SIZE OF GLASSES USED

Sight Feed	⅝x2 1/16	¾x3	¾x3	¾x3¼	¾x3¼	¾x3¼
Gauge	⅝x2 1/16	⅝x3¼	⅝x4⅜	⅝x4⅜	¾x6	¾x7¾
Sight Feed and Gauge Glasses				Each, Net		.10

HAND CYLINDER OIL PUMPS

TO GO ON TOP OF CYLINDER OR STEAM CHEST

Nos. 03, 6, 7 AND 9

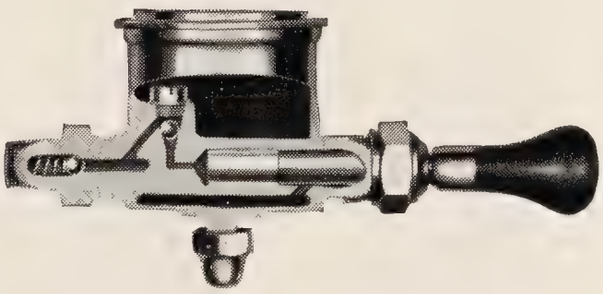


BOTTOM OUTLET

CODE: ENALBANDO

TO GO ON SIDE OF CYLINDER OR STEAM PIPE

Nos. 3, 04, 4, 8 AND 5

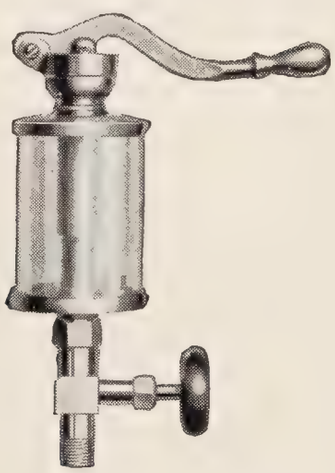


SIDE OUTLET

CODE: EMULABAMOS

Description		Brass Body					Glass Body			
No.	Side Outlet	3	04	4	8	5	3	04	4	5
	Bottom Outlet ...	03	6	7	9		03	6	7	
Capacity in Pints.....		⅛	¼	½	1	3	¼	½	1	3
Pipe Thread.....Inches		⅜	⅜	⅜	⅜	½	⅜	⅜	⅜	½
Polished Brass.....		6.00	7.00	9.00	11.00	25.00	6.00	7.00	9.00	25.00
Nickel Plated.....		6.50	7.50	9.75	11.75	26.00	6.50	7.50	9.75	26.00

GLASS BODY CYLINDER OIL PUMP

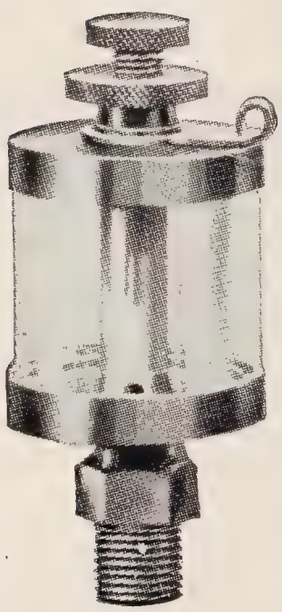


CODE: ENANTEMA

Capacity	Price Brass Finished Each	Price Nickeled Each	Size of Glass		Shank Iron Pipe Thread Size
			Diameter Inches	Height Inches	
¼ Pint	7.50	8.00	2¼	2⅛	½
½ Pint	8.50	9.00	3	3	½
1 Pint	10.00	10.50	3	4	½
1 Quart	15.00	15.75	3½	5	½

Above pumps are furnished with regular pipe thread shanks as noted above, unless otherwise specified.

GLASS OIL CUPS



No. 660
SLIDE LEVER WITHOUT SIGHT FEED

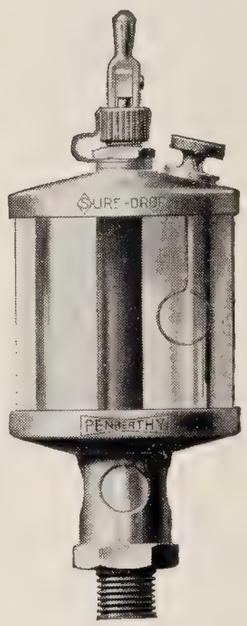
CODE: ENARGIARUM

No. 662
SLIDE LEVER AND SIGHT FEED

CODE: ENARRATIUS

No. 664
SNAP LEVER AND SIGHT FEED

CODE: ENARTHROSE



No. 665
SIGHT FEED FOR GAS OR GASOLINE ENGINES

CODE: ENASTILLAR

Number	00	0	1	1½	2	3	4	5	6	8
Iron Pipe Thread Shank	⅛	⅛	¼	¼	⅜	⅜	⅜	½	½	¾
Capacity.....Ounces	½	⅝	1	1½	2¼	4	5	10	18	32
No. 660, Finished Brass. Ea.		.80	1.00	1.25	1.50	1.90	2.40	3.10	4.00	
No. 662, Finished Brass. Ea.		1.25	1.50	1.75	2.10	2.55	3.15	3.90	4.80	
No. 664, Finished Brass. Ea.	2.85	3.00	3.25	3.50	3.75	4.25	5.25	7.25	9.25	
No. 665, Finished Brass. Ea.				2.00	2.80	3.50	4.00	5.40	7.00	14.00

These cuts illustrate the representative types of Oil Cups. Cast Brass Cups, standard in design, well constructed and suitable for ordinary usage, are regularly furnished at prices shown above.

Stamped Brass Cups of similar and attractive design can be furnished where requirements call for a more competitive article.

To set feed of the slide and index cups, turn the regulator to the left to increase, and to the right to diminish the flow of oil. To set feed of the snap lever cups, raise the lever, turn regulating nut until the desired feed is obtained. To cut off the feed, lower the lever. Cup can be flushed by setting lever at an angle of 45 degrees.

BRASS OIL CUPS

No. 650 PLAIN
CODE: ENATAVISSE

No. 652 HINGED LID
CODE: ENCALMAVAM

Diameter of Body..Inches	¾	⅞	1	1⅛	1¼	1½	1¾	2	2¼	2½	3
Shank, Iron Pipe Thread.	⅛	⅛	¼	¼	¼	⅜	⅜	⅜	½	½	¾
No. 650, Plain.....Each	.30	.35	.40	.50	.60	.90	1.25	1.75	2.25	2.75	4.00
No. 652, Hinged Lid.Each			1.00		1.40	1.85		3.10			

BRASS GREASE CUPS

No. 672
PLAIN
CODE: ENCAMBRABA

No. 668
SCREW FEED
CODE: ENCALYPTE

No. 670
AUTOMATIC FEED
CODE: ENCAMAROME

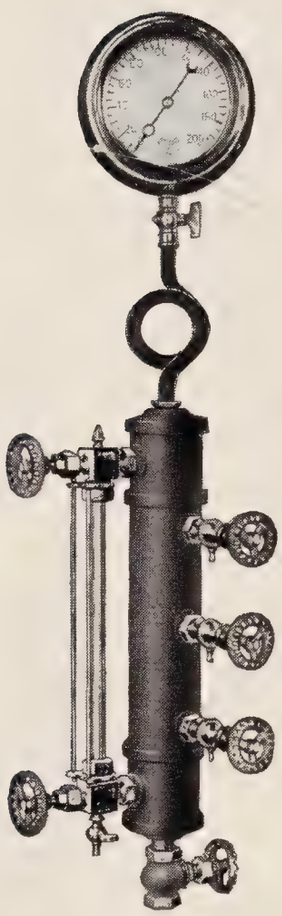
Diameter of Body.....Inches	1¼	1½	2	2½
Capacity (Grease).....Ounces	⅔	1	2	3½
Shank, Iron Pipe Thread.....	¼	¼	⅜	½
No. 672, Plain.....Each	.90	1.15	1.50	2.15

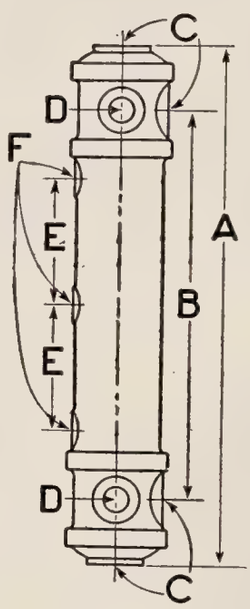
Number.....	00	0	1	2	3	4
Capacity (Grease).....Ounces	⅓	1	1½	3	6	10
Shank, Iron Pipe Thread.....	⅛	¼	¼	⅜	½	½
Extreme Outside Diameter.....Inches	1 7/16	1¾	2	2 9/16	3 3/16	3 11/16
No. 668, Screw Feed.....Each	1.00	1.20	1.60	2.00	2.80	4.00

Diameter of Body.....Inches	1¼	1½	2	2½	3
Capacity (Grease).....Ounces	1	1½	3	4½	6½
Shank, Iron Pipe Thread.....	¼	¼	⅜	½	½
No. 670, Automatic Feed.....Each	2.00	2.50	3.20	4.30	6.00

WATER COLUMNS

FOR STEAM WORKING PRESSURES UP TO 250 POUNDS





No. 640
CODE: ENCAMBULHO

Number	1	2	3	4
Price—Bodies Only, Tapped and Painted.....Each	2.75	4.00	6.00	8.00
A—Length Over All.....Inches	13 3/8	16 3/4	18 7/8	23 5/8
B—Center to Center of Boiler and Water Gauge Connections.....Inches	10	12 1/2	14	18
C—Size of Boiler and End Connections.....Inches	1/2	3/4	1	1 1/4
C—Size of Boiler and End Connections.....Millimeters	13	19	25	32
D—Size of Water Gauge Connections.....Inches	1/2	1/2	3/4	3/4
D—Size of Water Gauge Connections.....Millimeters	13	13	19	19
E—Center to Center of Gauge Cock Connections.....Inches	3 3/8	3 3/4	4 1/2	4
Number of Gauge Cock Tappings.....	2	3	3	3
F—Size of Gauge Cock Connections.....Inches	3/8	1/2	1/2	3/4
F—Size of Gauge Cock Connections.....Millimeters	10	13	13	19

Note.—When complete Water Columns are ordered we will furnish them with trimmings suitable for 175 pounds working pressure, unless otherwise specified.

SPECIFICATIONS FOR WATER COLUMN TRIMMINGS

TRIMMINGS THAT ARE STANDARD FOR ALL PRESSURES

Number	1	2	3	4
Iron Case Steam Gauge, Bourdon Spring Dia., Inches	5	5	6	6
Syphon for Steam Gauge.....Size, Inches	¼	¼	¼	¼
Bushing for Syphon.....Size, Inches	½x¼	¾x¼	1x¼	1¼x¼
Bushing for Globe Valves.....Size, Inches		¾x½	1x¾	1¼x¾
Nipple for Globe Valve.....Size, Inches	½x1½	½x1½	¾x2	¾x2

TRIMMINGS FOR LOW PRESSURE

Number	1	2	3	4
Gauge Cocks.....Size, Inches	2—⅜ No. 730	3—½ No. 730	3—½ No. 730	3—¾ No. 732
Water Gauge.....Size, Inches	½ No. 624 10-inch Centers	½ No. 624 12½-inch Centers	¾ No. 610 14-inch Centers	¾ No. 610 18-inch Centers
Globe Valve for Drain.....Size, Inches	½ No. 1	½ No. 1	¾ No. 1	¾ No. 1

TRIMMINGS FOR WORKING PRESSURES UP TO 175 POUNDS

Number	1	2	3	4
Gauge Cocks.....Size, Inches	2—⅜ No. 734	3—½ No. 734	3—½ No. 734	3—¾ No. 734
Water Gauges.....Size, Inches	½ No. 610 10-inch Centers	½ No. 610 12½-inch Centers	¾ No. 610 14-inch Centers	¾ No. 610 18-inch Centers
Globe Valve for Drain.....Size, Inches	½ No. 70	½ No. 70	¾ No. 70	¾ No. 70

TRIMMINGS FOR WORKING PRESSURES UP TO 250 POUNDS

Number	2	3	4
Gauge Cocks.....Size, Inches	3—½ No. 736	3—½ No. 736	3—¾ No. 736
Water Gauge.....Size, Inches	½ No. 616 12½-inch Centers	¾ No. 613 14-inch Centers	¾ No. 613 18-inch Centers
Globe Valve for Drain.....Size, Inches	½ No. 82-E	¾ No. 82-E	¾ No. 82-E

WATER GAUGES

BRASS

IRON WHEELS

LOW PRESSURE

No. 624
CODE: ENCANDEADO

MEDIUM
FOR STEAM WORKING PRESSURES UP TO 175 POUNDS

No. 610
CODE: ENCANAILLE

Size	Inches	1/2	3/4
Size	Millimeters	13	19
No. 610, Finished	Each	5.50	8.00
No. 624, Rough, Bronzed	Each	3.25	
Size of Glass	Inches	5/8x12	3/4x16
Center to Center of Cocks	Inches	13 5/8	18 1/4

EXTRA HEAVY

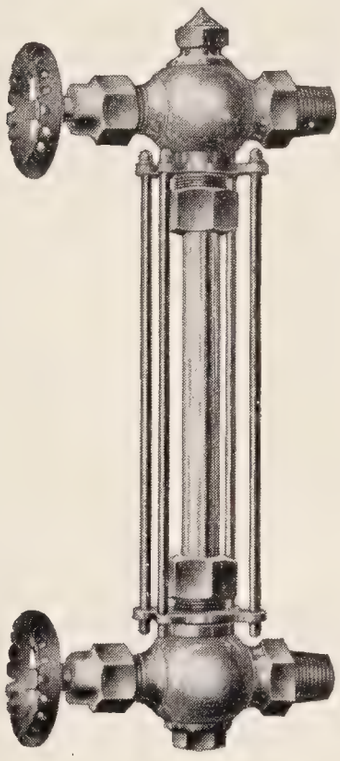
WATER GAUGES

BRASS

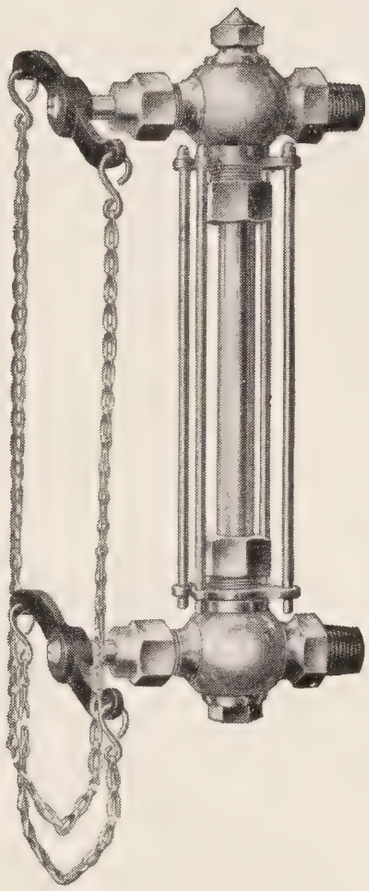
IRON WHEELS AND LEVERS

FOR STEAM WORKING PRESSURES UP TO 250 POUNDS

No. 616
CODE: ENCANGAVA



No. 613
CODE: ENCANDILAR



No. 615
CODE: ENCANELADO

Size	Inches	½	¾
Size	Millimeters	13	19
No. 613, Finished	Each		20.00
No. 615, Finished	Each		35.00
No. 616, Finished	Each	6.50	
Size of Glass	Inches	½x12	⅝x16
Center to Center of Cocks	Inches	14	19¼

The No. 613 and No. 615 Gauges are tapped for ⅜-inch drain and the glass can be replaced through the cap at the top while the boiler is under pressure by closing both valves.

The No. 615 is furnished complete with a lever chain that drops 12½ feet below the bottom valve. When valves are open, the levers stand in a horizontal position. To close, pull down the right side of levers to a 45 degree angle. These Water Gauges are especially adapted for boilers, having the Gauges above the reach of the operator. If the glass breaks, the engineer or fireman can close the gauge by a slight pull on the chain.

AJAX GAUGE GLASSES

PARTICULARLY ADAPTED TO BOTH HIGH AND LOW PRESSURES

TESTED AND APPROVED BY U. S. NAVY

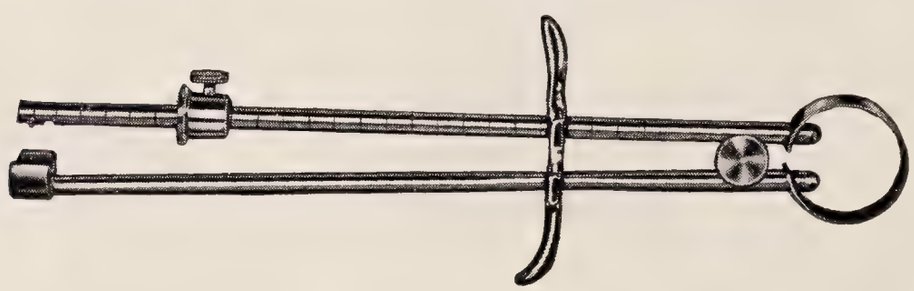
CODE: ENCANIJABA

Length.....Inches	10	11	12	13	14	15	16	17
5/8 Inch.....Per Dozen	3.00	3.24	3.60	3.84	4.20	4.44	4.80	5.04
3/4 Inch.....Per Dozen	3.60	3.96	4.32	4.80	5.16	5.52	5.88	6.24
Length.....Inches	18	19	20	22	24	30	36	
5/8 Inch.....Per Dozen	5.40	5.64	6.00	6.60	7.20	9.00	10.80	
3/4 Inch.....Per Dozen	6.60	7.08	7.44	8.16	8.88	11.16	13.44	

1/2 inch Glass Tubes same list as 5/8 inch.

GLASS TUBE CUTTERS

FOR CUTTING GAUGE GLASSES TO LENGTH



CODE: ENCARGASES

One arm has a scale in inches and fractions of an inch, a slide stop with set screw, and a rotary cutter at the end. This arm is inserted in the end of the glass tube to the required distance, against the slide stop or gauge, the outside of the glass tube resting in the circled end of the other arm. With a slight pressure of thumb and finger on the lever, and a rotation of the glass with the other hand, the rotary cutter makes an even cut around the inside of the tube and a very little pressure breaks it off.

Price, Tube Cutter Complete	Each	2.00
Price, Extra Cutter Wheels	Each, Net	.15

EXTRA BRASS GUARDS

FOR WATER GAUGES
CODE: ENCARNERA

17½ inches long	Each	.15
14½ inches long	Each	.12

Longer Guards to order.

RUBBER WASHERS

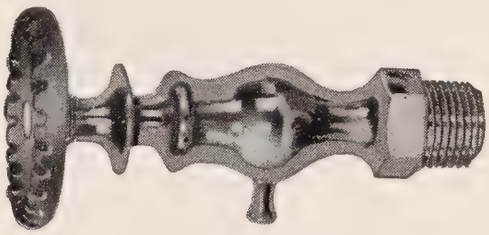
FOR WATER GAUGES
CODE: ENCAROPADO

Price	Per Dozen, Net	.12

COMPRESSION GAUGE COCKS

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS

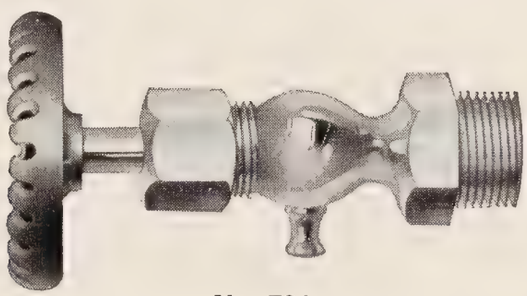
No. 730
SHORT PATTERN
CODE: ENCARPIUM



No. 732
LONG PATTERN
CODE: ENCARTAIT

Size.....Inches	3/8	1/2	3/4
Size.....Millimeters	10	13	19
No. 730.....Each	.95	1.00	
No. 732.....Each		1.20	1.35

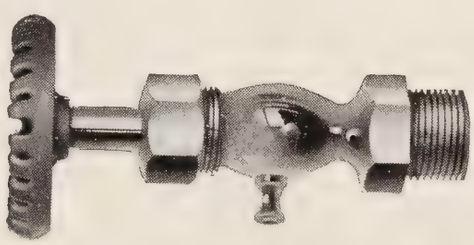
FOR STEAM WORKING PRESSURES UP TO 175 POUNDS



No. 734
WITH STUFFING BOX
CODE: ENCARTONAR

Size.....Inches	3/8	1/2	3/4
Size.....Millimeters	10	13	19
Price.....Each	1.20	1.30	1.45

FOR STEAM WORKING PRESSURES UP TO 250 POUNDS

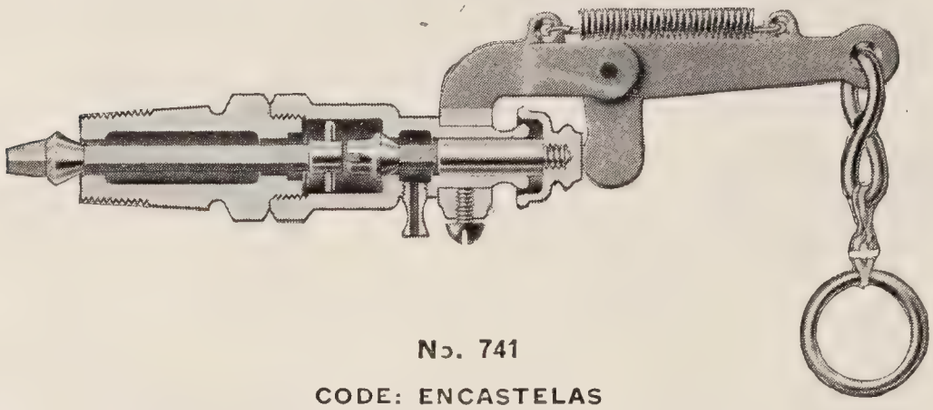


No. 736
WITH STUFFING BOX
CODE: ENCASCARAR

Size.....Inches	1/2	3/4
Size.....Millimeters	13	19
Price.....Each	1.50	1.70

CHAIN AND LEVER GAUGE COCKS

FOR STEAM WORKING PRESSURES UP TO 250 POUNDS



No. 741

CODE: ENCASTELAS

Size	Inches	¾
Size	Millimeters	19
Price, Complete with Chain	Each	8.50

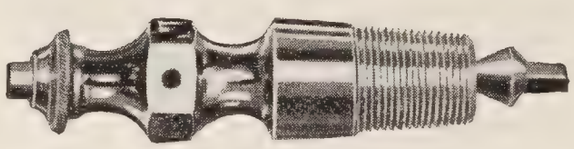
These Cocks are furnished complete with lever chains that drop 12½ feet below the Cock.

These Cocks are made with malleable iron levers, and fitted with double Valves.

The outer or secondary Valve can be removed and ground in when the boiler is under pressure. These Gauge Cocks can easily be tried from the floor by use of the chain.

MISSISSIPPI GAUGE COCKS

FOR STEAM WORKING PRESSURES UP TO 175 POUNDS



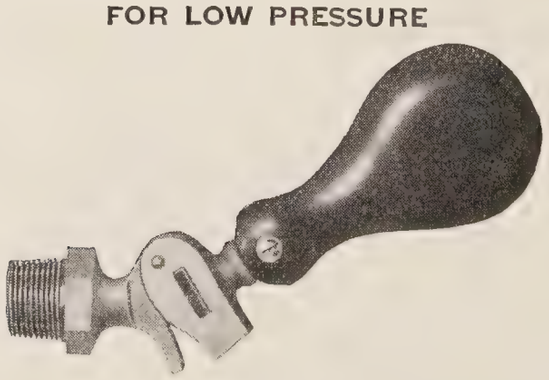
No. 738

CODE: ENCASTRANT

Size	Inches	⅜	½	¾
Size	Millimeters	10	13	19
Price	Each	.90	1.20	1.80

BALL GAUGE COCKS

FOR LOW PRESSURE



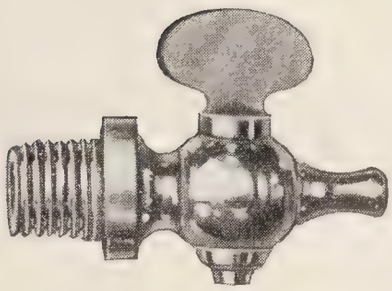
No. 740

CODE: ENCAUCHABA

Size	Inches	½	¾
Size	Millimeters	13	19
Price	Each	1.00	1.00

STEAM GAUGE AND AIR COCKS

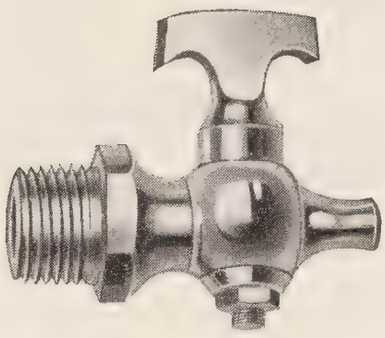
TEE OR LEVER HANDLE



STANDARD PATTERN

No. 700 TEE HANDLE
CODE: ENCAVALGAR

No. 702 LEVER HANDLE
CODE: ENCAVARIAN

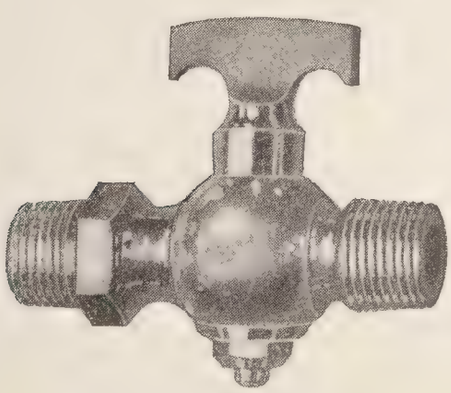


HEAVY PATTERN

No. 704 TEE HANDLE
CODE: ENCHABLER

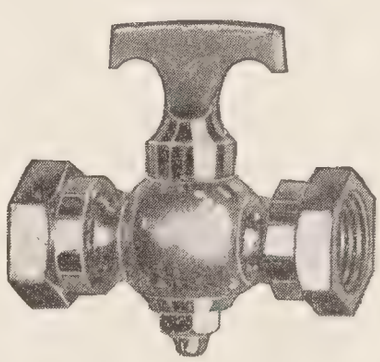
No. 706 LEVER HANDLE
CODE: ENCHAINONS

Size.....Inches	1/8	1/4	3/8	1/2
Size.....Millimeters	3	6	10	13
No. 700, Tee Handle.....Each	.40	.45	.50	.60
No. 702, Lever Handle.....Each	.55	.60	.65	.75
No. 704, Tee Handle.....Each		.80	.85	.90
No. 706, Lever Handle.....Each		.95	1.00	1.05



No. 708 TEE HANDLE
CODE: ENCHAPABA

No. 710 LEVER HANDLE
CODE: ENCHARAXIS

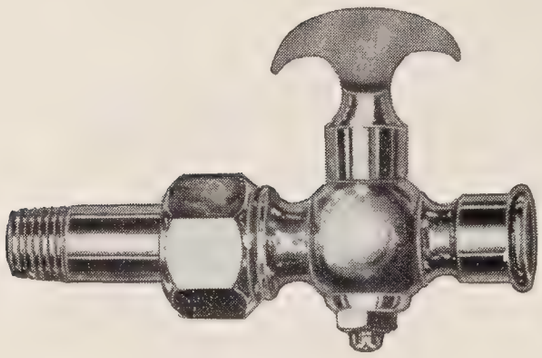


No. 712 TEE HANDLE
CODE: ENCHATONNA

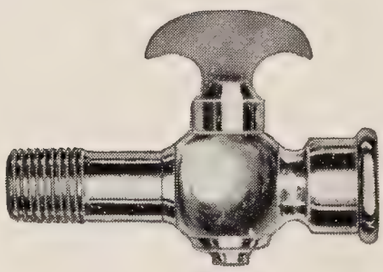
No. 714 LEVER HANDLE
CODE: ENCHELIDES

Size.....Inches	1/8	1/4	3/8
Size.....Millimeters	3	6	10
No. 708, Tee Handle, Male.....Each	.55	.65	.75
No. 710, Lever Handle, Male.....Each	.70	.80	.90
No. 712, Tee Handle, Female.....Each	.75	.85	.95
No. 714, Lever Handle, Female.....Each	.90	1.00	1.10

STEAM GAUGE COCKS



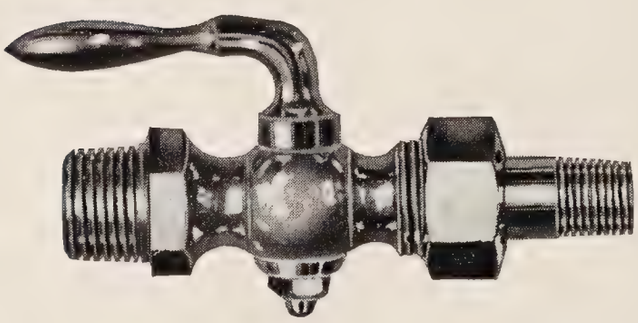
NO. 742
WITH UNION COUPLING
CODE: ENCHICABAN



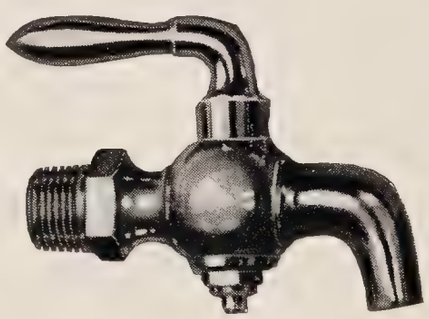
NO. 744
CODE: ENCHIFRENE

Size	Inches	1/4
Size	Millimeters	6
No. 742, with Union, Male and Female	Each	1.75
No. 744, Male and Female	Each	.75

CYLINDER COCKS



NO. 720
WITH UNION COUPLING
CODE: ENCHIMONA



NO. 724
WITH BIBB
CODE: ENCHUFAMOS

WITH UNION COUPLING

Size	Inches	3/8x1/8	1/2x1/4	3/4x3/8
Size	Millimeters	10x3	13x6	19x10
No. 720, Lever Handle	Each	2.00	2.50	3.75

The union end of the No. 720 Cocks is the smaller end.

WITH BIBB

Size	Inches	1/8	1/4	3/8	1/2	3/4
Size	Millimeters	3	6	10	13	19
No. 722, Tee Handle	Each	.70	1.00	1.15	1.60	2.35
No. 724, Lever Handle	Each	.85	1.15	1.30	1.85	2.60

FUSIBLE PLUGS

REGULAR LENGTH

NO. 750, FOR OUTSIDE INSERTION
CODE: ENCOJASTE

NO. 751, FOR INSIDE INSERTION
CODE: ENCOLELES

EXTRA LONG

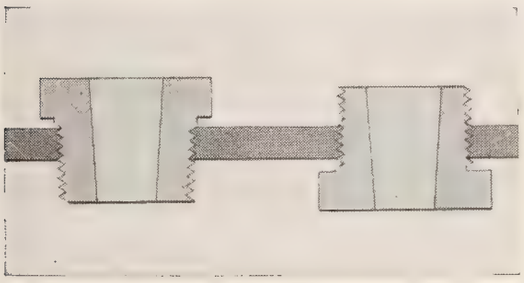
NO. 752, FOR OUTSIDE INSERTION
CODE: ENCOLLAGE

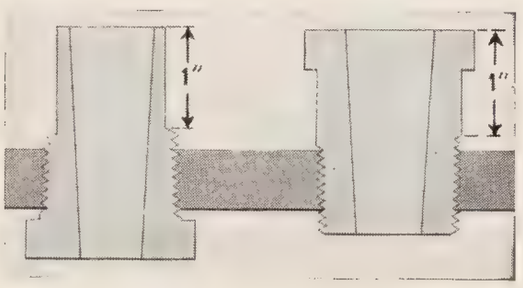
NO. 753, FOR INSIDE INSERTION
CODE: ENCOMBOMA

NO. 751
INSIDE TYPE

INSIDE OR PRESSURE SIDE

NO. 753,
INSIDE TYPE





NO. 750,
OUTSIDE TYPE

OUTSIDE OR FIRE SIDE

NO. 752,
OUTSIDE TYPE

Size.....Inches	3/8	1/2	3/4	1	1 1/4	1 1/2
No. 750 and No. 751.....Each	.55	.60	.75	1.00	1.50	2.00
No. 752 and No. 753.....Each	1.10	1.20	1.50	2.00	3.00	4.00
No. 752-L and No. 753-L Oversize Threads.....Each	....	....	1.60	2.15		

Our Fusible Plugs are filled with pure Banca Tin.

RECOMMENDATIONS

Nos. 750 and 751 for ordinary service.

Nos. 752–752-L–753 and 753-L to comply with the latest rules issued by the Steamboat Inspection Service of the United States Government for pressures up to 150 pounds. For higher pressures, plugs will be made with special small diameter of filling. Orders must specify working pressures.

Nos. 752–752-L–753 and 753-L to comply with various State and City Laws requiring Fusible Plugs with extensions.

½-inch to 1½-inch inclusive, Nos. 752–752-L and ⅜ to 1½-inch inclusive, 753 and 753-L to comply with the A. S. M. E. Boiler Code for pressures up to 175 pounds. For higher pressures plugs will be made with special small diameter of filling. Orders must specify working pressures.

Plugs should be installed in direct passage of the fire or gases with small end of the Banca Tin exposed to the fire or gases. These plugs are NOT to be used inside a steam drum, etc., where the temperature of the steam is used as a fusing agent.

STAMPING

Nos. 750 and 751 are stamped as shown.

Nos. 752–752-L–753 and 753-L are stamped as shown and in addition have the heat number stamped in compliance with the Steamboat Inspection Service of the United States Government.

CONSTRUCTION

The No. 750 is made regular length and constructed for outside insertion.

The No. 751 is made regular length and constructed for inside insertion.

The Nos. 752 and 752-L are made extra long (having an extension one inch beyond the thread) and constructed for outside insertion only. The Nos. 753 and 753-L are made extra long and constructed for inside insertion only. We can furnish these to order any length desired, at special prices according to quantity wanted.

ORDERING

In ordering, always give style, number and size.

When not otherwise specified, the outside type will be furnished as follows:

No. 750—For ordinary service.

No. 752—For the Steamboat Inspection Service of the United States Government and for some State and City Laws, and also for the A. S. M. E. Boiler Code.

BRASS STEAM WHISTLES

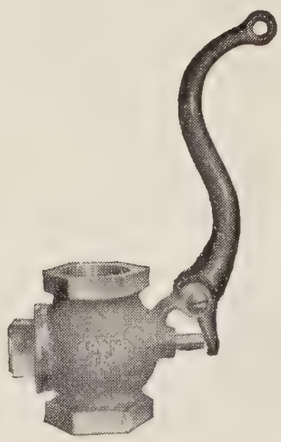
FOR STEAM WORKING PRESSURES UP TO 125 POUNDS

No. 600

WITH LEVER VALVE
CODE: ENCOMPADRO

No. 602

WITHOUT VALVE
CODE: ENCONTRADA



No. 608

WHISTLE VALVE
CODE: ENCORDOAVA

WHISTLES

Diameter of Bell.....Inches	1	1¼	1½	2	2½	3	3½
Length of Bell.....Inches	2½	3	3¼	4	4½	5	5½
Size of Pipe.....Inches	¼	¼	⅜	½	¾	¾	1
Size.....Millimeters	6	6	10	13	19	19	25
No. 600.....Each	3.10	3.75	4.00	5.50	6.50	8.50	11.50
No. 602.....Each	2.20	2.75	3.00	4.35	5.25	7.25	9.50
Diameter of Bell.....Inches	4	5	6	8			
Length of Bell.....Inches	6½	8	9½	14			
Size of Pipe.....Inches	1¼	1½	2	2½			
Size.....Millimeters	32	38	50	64			
No. 600.....Each	15.00	22.50	33.00	95.00			
No. 602.....Each	12.00	19.00	24.00	70.00			

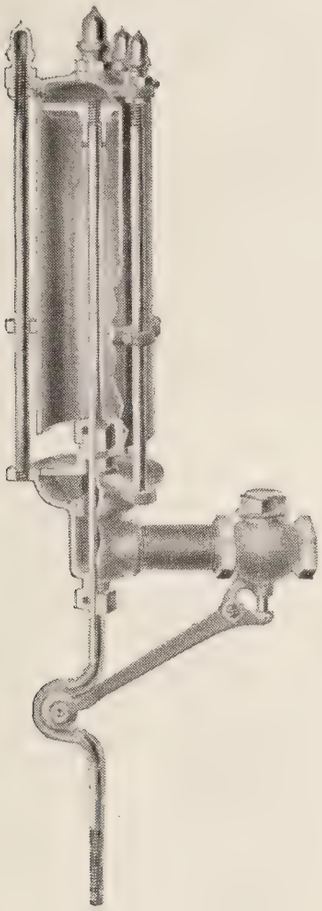
Brass Whistles of a greater diameter or with a greater length of bell than listed above will be made to order at a special price.

Always order Whistles by the diameter of bell and not by the size of pipe.

Whistles for higher pressures made to order at an extra price.

WHISTLE VALVES

Size.....Inches	⅜	½	¾	1	1¼	1½	2	2½	3
Size.....Millimeters	10	13	19	25	32	38	50	64	76
No. 608.....Each	2.00	2.50	3.00	3.50	5.00	6.00	9.00	18.00	27.00



No. 604
CODE: ENCORPASSE

MOCKING BIRD STEAM OR AIR WHISTLES

FOR STEAM OR AIR WORKING PRESSURES UP TO 125 POUNDS

Diameter of Bell...Inches	3	4	5	6
Length of Bell.....Inches	9	12	15	18
Size of Pipe.....Inches	1	1¼	1½	2
Size of Pipe...Millimeters	25	32	38	50
No. 604.....Each	40.00	53.00	70.00	95.00

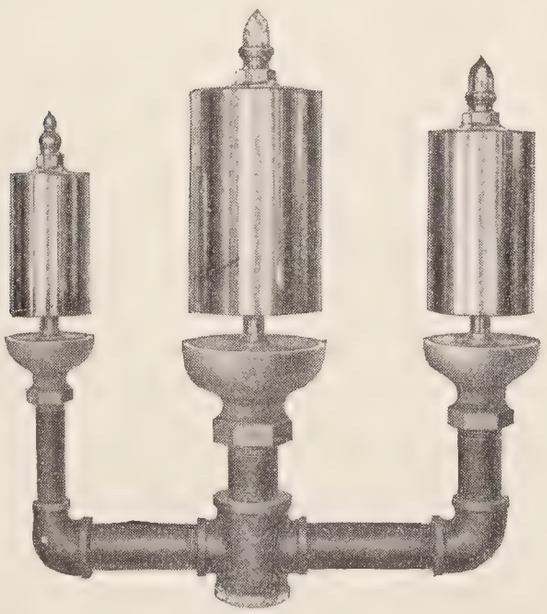
This improved piston Whistle is particularly adapted for river boats, fog signals, fire alarms, etc., as it can be distinguished easily at a long distance.

Always order Whistles by the diameter of the bell, and not by the size of pipe.

CHIME STEAM WHISTLES

BRASS, WITH IRON PIPE AND FITTINGS

Any Number or Size of Bells Made to Order



No. 606
CODE: ENCOSADURA

PRICES ON APPLICATION

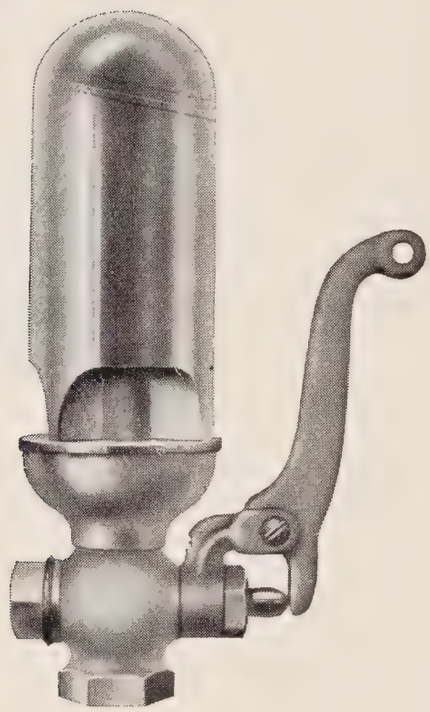
For details giving dimensions and makeup of the No. 606 Chime Whistle, see page 625.

SINGLE BELL

CHIME WHISTLE

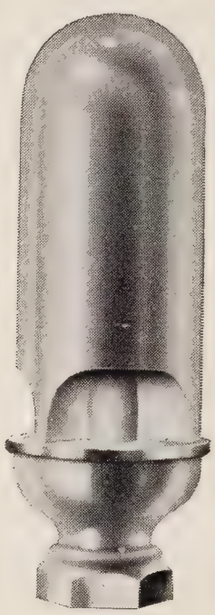
FOR STEAM OR COMPRESSED AIR

SUITABLE FOR WORKING PRESSURES FROM 25 TO 150 POUNDS



No. 607
WITH LEVER VALVE

CODE: ENCOSTARSE



No. 607½
WITHOUT VALVE

CODE: ENCUADERNA

Diameter of Bell Inches	Size of Pipe Inches	Size of Pipe Millimeters	No. 607 With Lever Valve Each	No. 607½ Without Valve Each
1½	⅜	10	6.00	4.50
2	½	13	7.00	5.00
2½	¾	19	9.00	7.00
3	¾	19	11.00	8.00
3½	1	25	15.00	11.00
4	1¼	32	18.00	14.00
5	1½	38	28.00	22.00
6	1½	38	42.00	38.00
8	2	50	100.00	85.00

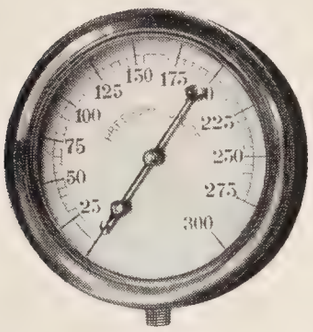
Chime Whistles can only be furnished with Pipe Connection as listed above.

Always order Whistles by the diameter of Bell, and not by the size of Pipe Connection.

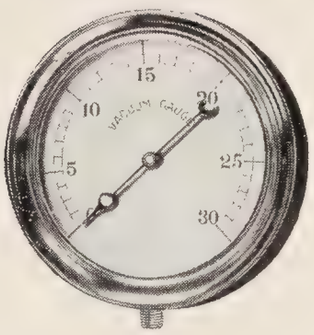
Special Whistles made to order for Air Pressures below 25 pounds. Prices on application.

SINGLE BOURDON SPRING

PRESSURE AND VACUUM GAUGES



PRESSURE GAUGE
CODE: ENCUBRISTE



VACUUM GAUGE
CODE: ENDOPATHIC

Size Dial	Iron Case with Brass Ring	Iron Case with N. P. Ring	Brass Case	Brass Case Nickel Plated All Over	Standard Graduations of Dial Pressures
Inches	Each	Each	Each	Each	
12	50.00	51.50	75.00	79.00	30–100–200 300–500
10	32.00	33.00	40.00	43.00	
8½	22.00	22.75	30.00	32.50	
6¾	16.00	16.60	20.00	22.00	
6	13.00	13.50	16.00	17.50	30–60–100 160–200–300 500
5½	10.00	10.25	12.00	13.25	
5	8.00	8.20	11.00	12.00	
4½	8.00	8.20	10.00	11.00	
3½	7.00	7.18	9.00	9.75	30–60–100 160–200–300
3	6.00	6.15	8.00	8.60	
2½	6.00	6.15	8.00	8.60	
2	6.00	6.15	8.00	8.60	

Unless otherwise specified, Iron Case Gauge with Brass Ring will always be furnished.

Double Bourdon Spring Gauges: Prices on application.

Above prices, 3-inch and larger, include Cocks with each Gauge. On smaller sizes, Cocks will be furnished at an extra price.

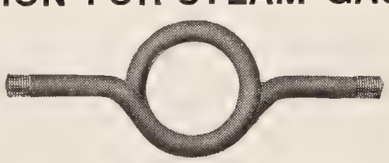
No Steam Gauge warranted unless properly connected with Syphon.

When ordering, do not fail to state: Size Dial and Style of Gauge; also the maximum pressure to which the dial is to be graduated. Graduations ordered other than specified in above table of Standards, will be considered special and an extra price charged.

Vacuum Gauges, unless otherwise specified, will always be furnished graduated to 30 inches. They can be graduated to equivalent in pounds, instead of inches, if so stated when ordering.

Extra charge made for name on Dials.

SYPHON FOR STEAM GAUGES

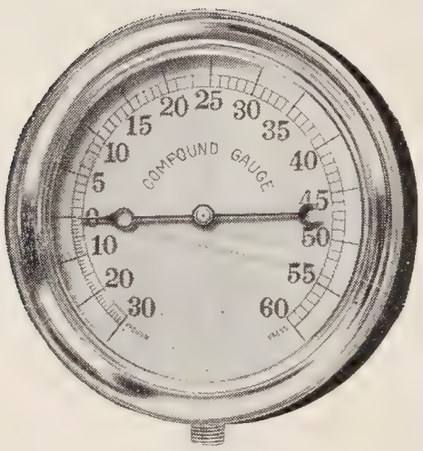


CODE: ENFERMEDAD

Size	Inches	¼
Size	Millimeters	6
Price, length 8 inches, Iron	Each	.50
Price, length 8 inches, Brass	Each	1.00

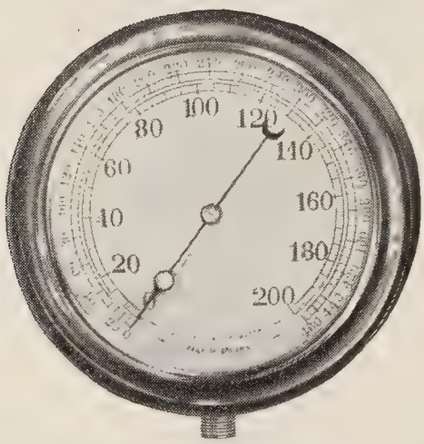
COMPOUND AND COMBINATION

GAUGES



COMPOUND PRESSURE AND VACUUM GAUGE

CODE: ENFIAMENTO



COMBINATION WATER PRESSURE GAUGE

CODE: ENFORTINDO

Size Dial Inches	Iron Case with Brass Ring Each	Iron Case with N. P. Ring Each	Brass Case Each	Brass Case Nickel Plated all Over Each
12	60.00	61.50	80.00	84.00
10	40.00	41.00	50.00	53.00
8½	30.00	30.75	40.00	42.50
6¾	20.00	20.60	25.00	27.00
6	16.00	16.50	20.00	21.50
5½	14.00	14.25	16.00	17.25
*5	14.00	14.25	16.00	17.25
4½	12.00	12.20	14.00	15.00
†3½	10.00	10.18	12.00	12.75

* The 5-inch Combination Water Pressure Gauges take the same list prices as the 4½ dial.

† The 3½-inch size is not made in the Combination Water Pressure Gauge.

Unless otherwise specified, Iron Case Gauge with Brass Ring will always be furnished.

Above prices include Cock with each Gauge.

No Steam Gauge warranted unless properly connected with Syphon.

When ordering, do not fail to state size of Dial and Style of Gauge, also the maximum pressure to which the Dial is to be graduated.

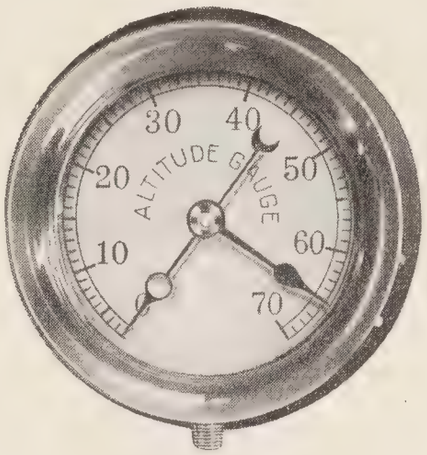
The Standard Graduations for all sizes of Compound Pressure and Vacuum Gauges are—30, 60, 100 and 160 pounds pressure and 30 inches vacuum, and for Combination Water Pressure Gauges, 100, 200 and 300 pounds pressure and equivalent in feet. Any other Dial Graduations ordered will be considered special and an extra price charged.

The Vacuum side of the Compound Gauge can be graduated to equivalent in pounds, instead of inches, if so stated when ordering.

Extra charge made for name on Dials.

ALTITUDE GAUGES

Gauges will be furnished graduated to a maximum of 70 feet. Any other variation will be at an extra price.



WITH ADJUSTABLE HAND
CODE: ENGASTAREM

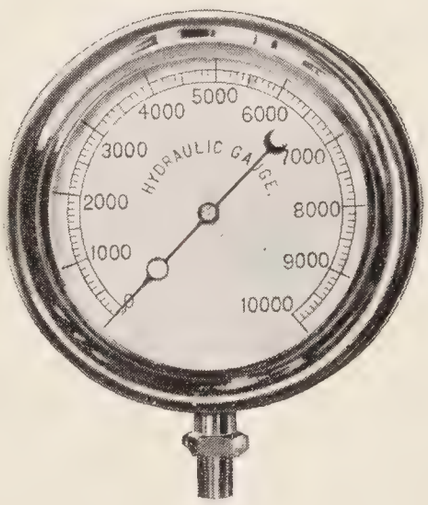
Unless otherwise ordered, Iron Case Gauge with Brass Ring, will always be furnished.

Prices include Cock with each Gauge.

Size Dial Inches	Iron Case with Brass Ring Each	Iron Case with N. P. Ring Each	Brass Case Each	Brass Case Nickel Plated all Over Each
12	60.00	61.50	80.00	84.00
10	40.00	41.00	50.00	53.00
8½	30.00	30.75	40.00	42.50
6¾	20.00	20.60	25.00	27.00
6	16.00	16.50	20.00	21.50
5½	14.00	14.25	16.00	17.25
5	12.00	12.20	14.00	15.00
4½	12.00	12.20	14.00	15.00

HYDRAULIC GAUGES

When ordering, state the maximum pressure to which the Gauge is to be graduated. All Gauges should be graduated to double their working pressure, Hydraulic Cock and Check Valves, extra.



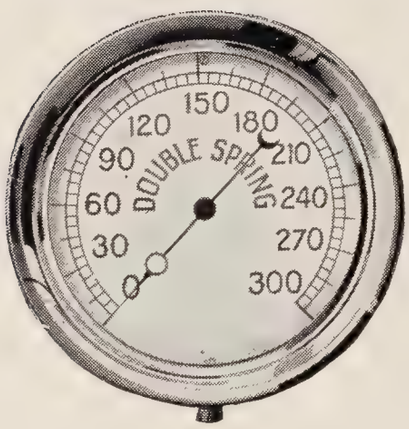
WITH STEEL SPRING
CODE: ENGELCHOR

If a double scale, showing pounds pressure per square inch and tons on Ram is required, state the diameter of Ram and the number of tons to which the Gauge is to be graduated.

Size Dial Inches	Iron Case with Brass Ring Each	Iron Case with N. P. Ring Each	Brass Case Each	Brass Case Nickel Plated all Over Each
8½	70.00	70.75	80.00	82.50
6¾	50.00	50.60	60.00	62.00
6	35.00	35.50	40.00	41.50
5	30.00	30.50	35.00	36.00
4½	25.00	25.50	30.00	31.00

For Gauges with Maximum Hand, add $5.00 to List Prices.

DOUBLE SPRING GAUGES



CODE: ENGENHAMOS

Double Spring Gauges are of the most rugged construction throughout and should be employed where severe service conditions exist.

Size Dial Inches	Iron Case with Brass Rings Each	Iron Case with N. P. Ring Each	Brass Case Finished Each	Brass Case N. P. Each	Brass Case N. P. Deep Each
4½	10.00	10.20	12.00	13.00	
5	11.00	11.20	13.00	14.00	
5½	12.00	12.25	14.00	15.25	
6	15.00	15.50	18.00	19.50	
6¾	18.00	18.60	22.00	24.00	27.00
8½	25.00	25.75	34.00	36.50	40.00
10	37.00	38.00	45.00	48.00	52.00
12	55.00	56.50	80.00	84.00	89.00
16	105.00	107.00	140.00	150.00	

Range of graduation: 100 to 1,000 pounds.

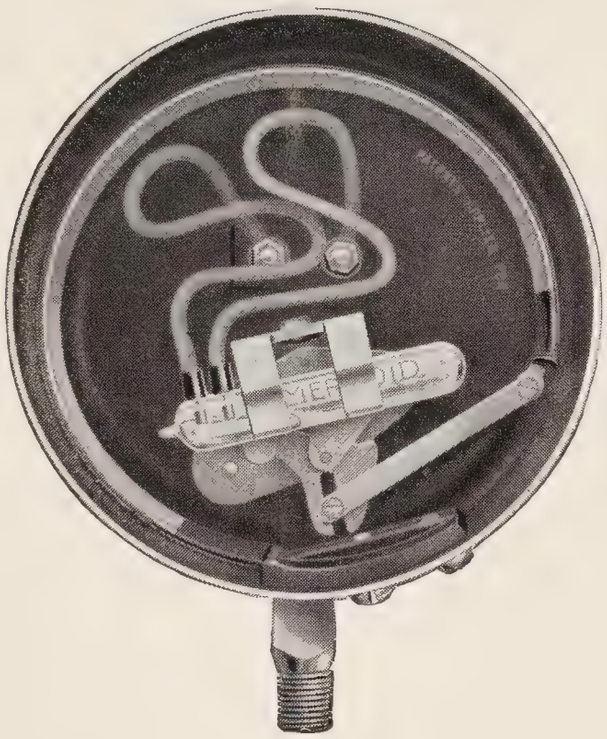
The 4½ and 5-inch Double Spring Gauges are furnished with close nickel rings and without Back Flanges, where specified for traction work. Gauges used to register steam pressures must be siphoned.

Prices above include a T Handle Cock for sizes 4½ to 6¾ inches, inclusive. A small Union Cock for sizes 8½ and 10 inches, and a large Union Cock for the 12-inch size. Regularly furnished with ¼-inch male bottom connections.

FEDERAL MERCOID ELECTRICAL CONTROL SWITCHES

FOR USE WHERE IT IS DESIRED TO CONTROL ELECTRICALLY, PRESSURE, VACUUM OR THERMOSTATIC APPARATUS

Sealed glass tube, containing inert gas and mercury. This sealed tube is tilted by the movement of the Bourdon Tube, the mercury in the tube forming a circuit contact or breaking the circuit contact, depending on the tilt of the tube.



No corrosion or oxidation of contacts.

A positive safeguard against fire or explosion.

No open arc.

CODE: ENGODARDES

Adjusted to open and close circuit at any point within the range.

Accurate and positive in operation. Thousands of combinations available.

MERCOID ROOM THERMOSTATS, MERCOID HOT WATER TEMPERATURE CONTROLS, and MERCOID AIR COMPRESSOR SWITCHES, represent only a few of the fields in which MERCOIDS are used.

Two very popular Types are listed below:

WATER SYSTEM TYPE

Minimum range of 15 pounds on pressures up to 60 pounds; on higher pressures, up to 300 pounds, range approximately 20%.

(a) Single Pole	20.00
(b) Double Pole	30.00
(c) Single Pole Hand Reset	21.00
(d) Two-circuit (Single Pole and Alarm)	26.00

AMMONIA TYPE

For pressures 100 to 300 pounds, approximately 20% range, furnished automatic on one side, with hand reset for restarting the motor, or fully automatic.

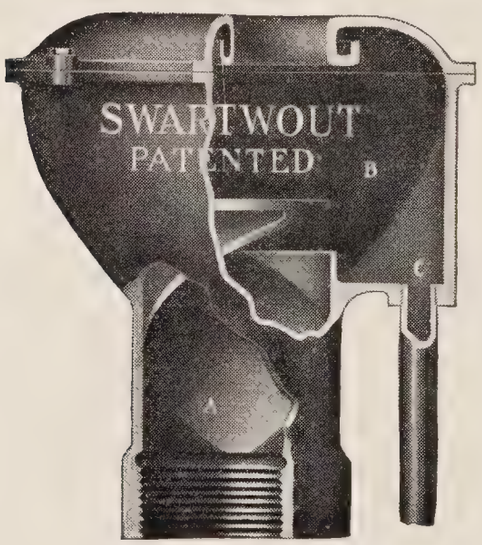
Single Pole	36.00
Double Pole	46.00
Single Pole Hand Reset	37.00
Two- circuit (Single Pole and Alarm)	42.00

(Closer ranges furnished at small extra charge.)

Prices on application where special requirements are involved.

CAST IRON

EXHAUST PIPE HEADS



CODE: ENGREGGE

For Pipe Size Inches	Price Screwed Each	Price Flanged Each	Size of Drip Inches	Diameter Flange Inches	Greatest Diameter Inches	Total Height Inches
1-1½	25.00		¾		7¾	7¾
2-2½	30.00		1		9	9¾
3-3½	35.00		1		10½	10⅝
4-4½	45.00		1		11½	11 11/16
5	50.00		1¼		13⅞	13¼
6		60.00	1¼	11	16	14⅞
7		75.00	1¼	12½	18¼	17¼
8		90.00	1¼	13½	20	17⅞
10		115.00	2	16	23	21¾
12		155.00	2½	19	28½	25
14		190.00	2½	21	31½	27⅜
16		230.00	3	23½	34¼	30⅜
18		300.00	3	25	38	33⅞
20		360.00	3½	27½	41½	37⅜
*22		730.00	4	32	51	45¾
24		730.00	4	32	51	45¾
26		Prices	4½	38¾	62	57
28		on	4½	38¾	62	57
30		Applica-	4½	38¾	62	57
36		cation	5	46	75	66¾

The flanges on Heads 6 inches and larger conform to the American Standard for Low Pressure and are furnished faced and drilled. The holes straddle center line of drip outlet. Companion flanges and bolts are furnished only when ordered at a special price.

*The 22-inch size is the 24-inch pattern with Reducing Flange Bolted on. This Reducing Flange is charged extra.

INDICATOR POSTS

These posts are made in two patterns; the STANDARD PATTERN suitable for all ordinary installations, and the UNDERWRITER PATTERN which is designed in accordance with the rules and requirements of the National Fire Protection Association and is marked "CU" to denote its use for fire protection service.

The object of these Indicator Posts is to provide means for operating underground Valves and furnish a positive indicator showing whether the Valves are open or closed. They are used principally in factory or mill yards in connection with the fire protection service, but may, with advantage, be used at any point where the Valve is underground.

The use of this post does away with the annoyance and delay of searching for a Valve box, which may be covered with snow or dirt.

The device consists of a strong cast-iron, tubular adjustable post, made in two or more sections, as depth requires, which extends below the surface, where it is fastened to the Valve. The valve stem is joined to the square operating rod by a suitable socket. Turning the nut to the left opens the Valve and exposes the word "Open" through the glass of the indicator; turning to the right closes the Valve and exposes the word "Shut."

Indicator Posts for Valves opening to the Right can be furnished on special order.

The operating nut is made 1¼ inches square, unless otherwise ordered.

The post is not affected by the elements. The indicator openings are provided with removable metal frames, which carry heavy plate glass ½-inch thick. The letters are large and easily read.

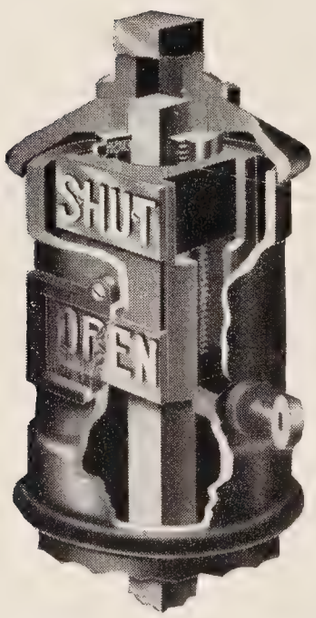
To prevent moisture gathering on indicator glass during cold weather, small openings are provided under cover which thoroughly ventilate the entire post.

The lower plate of the Indicator is adjustable, and its position on this Indicator is changed to suit the size of the Valve.

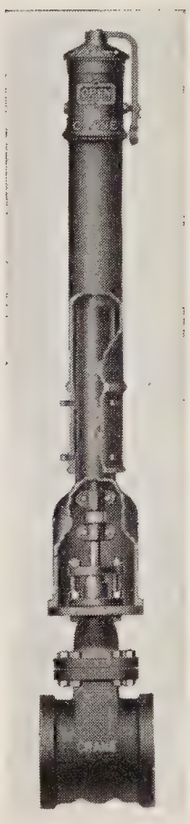
INDICATOR POSTS

STANDARD PATTERN

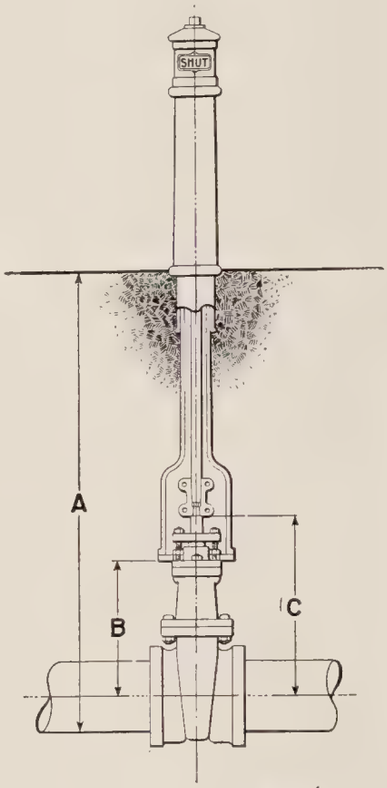
SUITABLE FOR OPERATING VALVES FROM 2 TO 14 INCH

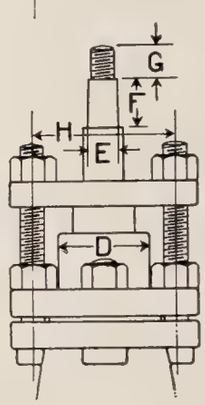


ENLARGED SECTIONAL VIEW OF HEAD DOUBLE FACE



No. 520
AS APPLIED TO GATE VALVE
CODE: ENGSINNIGE





INFORMATION FOR ORDERING

Distance from Ground Level to Bottom of Pipe	Feet	2 to 6
Indicator Post, including Wrench	Each	40.00

Posts for bury greater than 6 feet; prices on application.

When ordering, state size and catalogue number of Valve. Also give distance from ground level to bottom of pipe or trench, as shown by dimension A on illustration above.

When post is to be used with other than Crane Valves, state name of maker of Valve, size and style of end connections; also

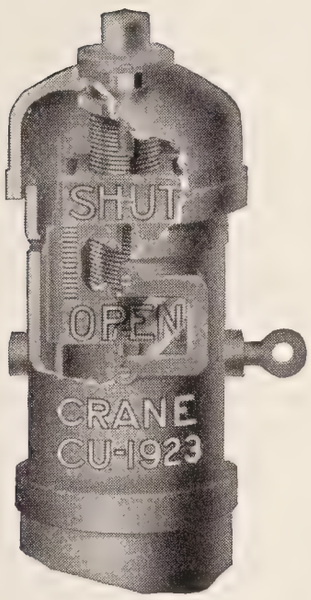
1—Whether Valves open by turning to right or left.
2—Number of turns required to fully open and close.
A—Depth of trench.
B—Center of pipe to top of stuffing box flange.
C—Center of pipe to bottom of Valve stem square.
D—Diameter of stuffing box.
E—Size of square on Valve stem.
F—Height of square on Valve stem.
G—Length of threaded end on Valve stem.
H—Diameter of stuffing box bolt circle.
J—Diameter of stuffing box studs.
K—Number of stuffing box studs.

Indicator Posts, when furnished for use with other than Crane Valves, will be made to order at a special price.

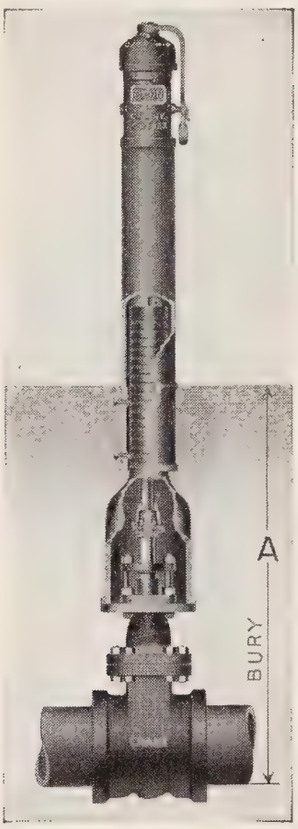
INDICATOR POSTS

FOR FIRE PROTECTION SERVICE, UNDERWRITERS' PATTERN

SUITABLE FOR OPERATING VALVES FROM 2 TO 14 INCH



ENLARGED SECTIONAL
VIEW OF HEAD
DOUBLE FACE



NO. 510
AS APPLIED TO
No. 462½ GATE VALVE

CODE: ENGYSTOMA

Distance from Ground Level to Bottom of Pipe	Feet	2 to 6
Indicator Post, including Wrench	Each	40.00

Posts for bury greater than 6 feet, prices on application.

WHEN ORDERING, STATE SIZE AND CATALOGUE NUMBER OF VALVE. ALSO GIVE DISTANCE FROM GROUND LEVEL TO BOTTOM OF PIPE OR TRENCH, AS SHOWN BY DIMENSION A ON ILLUSTRATION ABOVE.

WHEN ORDERING POSTS FOR USE WITH OTHER THAN CRANE VALVES, GIVE INFORMATION REQUESTED ON PAGE 308.

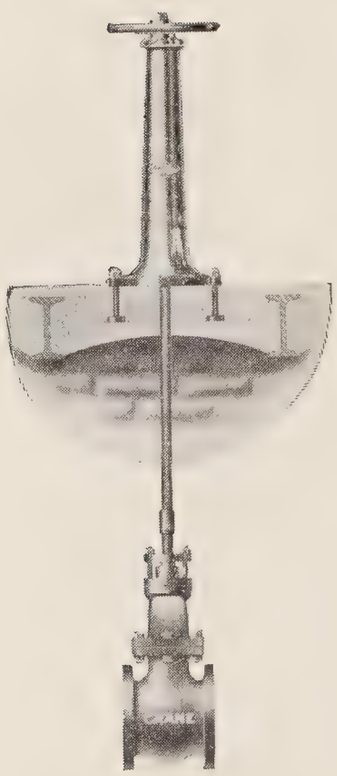
These Posts are designed in accordance with the rules and requirements of the NATIONAL FIRE PROTECTION ASSOCIATION.

These Posts are marked "CU" to denote their use for fire protection service.

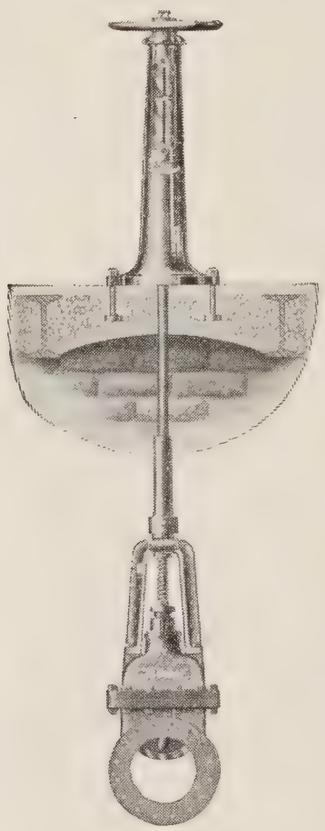
FLOOR STANDS

WITH OR WITHOUT INDICATOR ATTACHMENTS

SUITABLE FOR RISING OR NON-RISING STEM VALVES



FLOOR STAND WITHOUT INDICATOR
ATTACHED TO
NON-RISING STEM VALVE
CODE: ENHORQUEN



FLOOR STAND WITH INDICATOR
ATTACHED TO
RISING STEM VALVE
CODE: ENICONETTE

PRICE LIST

WITHOUT INDICATOR	20 Inches High	32 Inches High
Painted column; japanned wheel; wheel stem coupling; no extension stem or sleeve furnished.....Each	15.00	20.00
Finished column; japanned wheel; wheel stem coupling; no extension stem or sleeve furnished.....Each	28.00	35.00
Finished column; rim and hub of wheel finished, spokes japanned; no extension stem or sleeve furnished.....Each	40.00	48.00

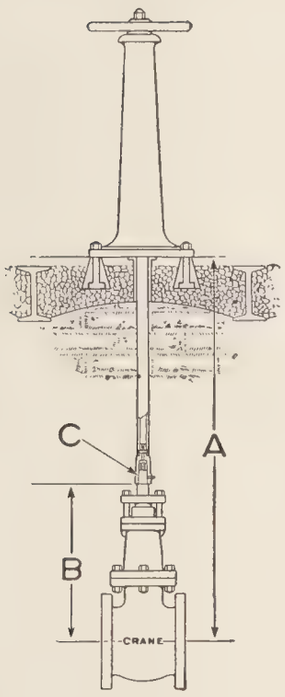
WITH INDICATOR	20 Inches High	32 Inches High
Painted column; japanned wheel with indicator trimmings complete; no extension stem or sleeve furnished.....	22.00	27.00
Finished column; japanned wheel with indicator trimmings complete; no extension stem or sleeve furnished.....	35.00	42.00
Finished column; rim and hub of wheel finished, spokes japanned; indicator trimmings complete; no extension stem or sleeve furnished.....	47.00	55.00

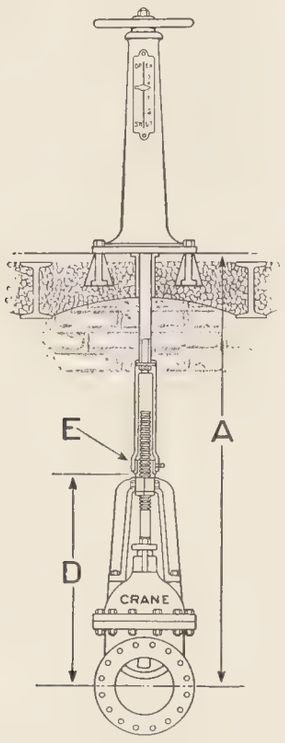
Extension stems extra. Price according to length, size and style of valve.
Directions for ordering Floor Stands on page 311.

FLOOR STANDS

WITH OR WITHOUT INDICATOR ATTACHMENTS

SUITABLE FOR RISING OR NON-RISING STEM VALVES





DIRECTIONS FOR ORDERING FLOOR STANDS FOR ALL VALVES

1—Specify with or without indicator.
2—Give size and style of valve.
3—Give manufacturer's name and catalogue number of valve.
4—Give outside diameter of hand wheel on valve.
5—Give number of turns right or left to open valve.

IF WANTED WITH EXTENSION STEMS

The following additional information is required.
A—Center of valve to floor level.

NON-RISING STEM VALVES

B—Center of valve to bottom of square on valve stem.
C—Size and length of square part of valve stem, and whether square is straight or tapered.

RISING STEM VALVES

D—Center of valve to bottom of sleeve.
E—Give in detail construction of sleeve where wheel fits.

Note.—Unless otherwise specified, the 32-inch high stand will be furnished for valves having a hand wheel 9 inches and larger in diameter and the 20-inch high stand for valves having a hand wheel less than 9 inches in diameter.

Extension stems are made up of extra strong pipe with suitable couplings riveted to them, unless otherwise ordered.

In addition to regular stands we can furnish special stands for various conditions.

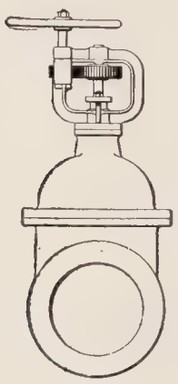
See page 313 for a number of various applications of floor stands.

Drawings and estimates furnished on floor stands for special applications.

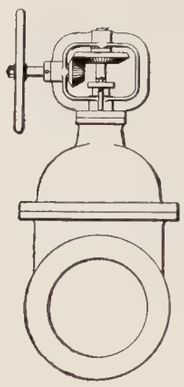
ILLUSTRATING VARIOUS STYLES OF

GEARING FOR OPERATING LARGE VALVES

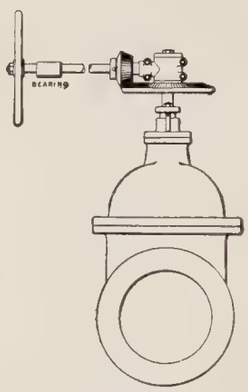
NON-RISING STEM VALVES



STYLE S
SPUR GEARING
CODE: ENJARETAD

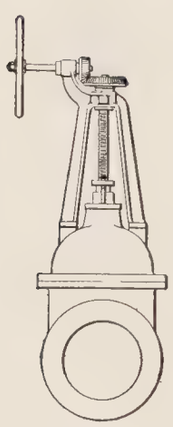


STYLE U
BEVEL GEARING
CODE: ENJAULABAN

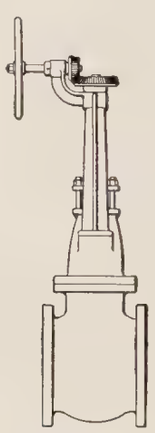


STYLE V
BEVEL GEARING WITH EXTENDED SHAFT, BOX AND HAND WHEEL WHICH CAN BE SET AT ANY HORIZONTAL ANGLE.
CODE: ENJAULASTE

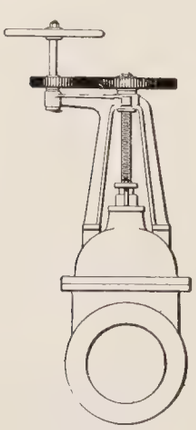
RISING STEM VALVES



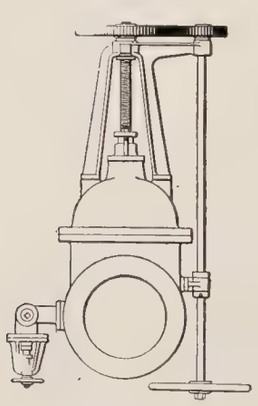
STYLE N
PINION SHAFT PERPENDICULAR TO RUN OF VALVE
CODE: ENJAVELONS



STYLE O
PINION SHAFT PARALLEL TO RUN OF VALVE
CODE: ENJEBABAS



STYLE P
SPUR GEARING WITH HAND WHEEL ABOVE
CODE: ENJEBENLO



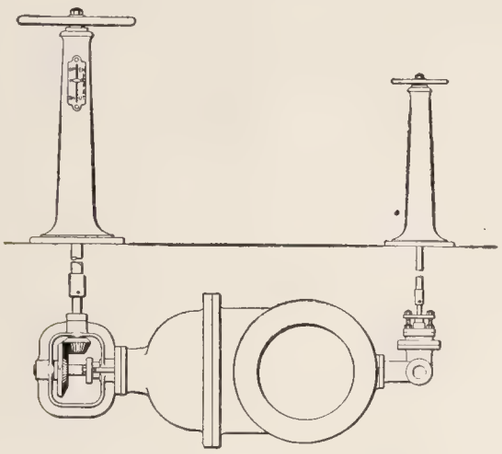
STYLE Y
SPECIAL SPUR GEARING WITH EXTENDED OPERATING SHAFTS FOR OPERATING DIRECTLY BELOW
CODE: ENJERGAD

PRICES ON APPLICATION

ILLUSTRATING VARIOUS APPLICATIONS OF

CRANE FLOOR STANDS

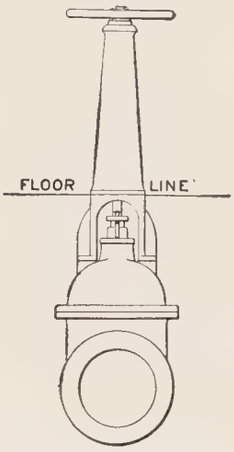
WITH OR WITHOUT INDICATOR ATTACHMENTS



APPLICATION E

FLOOR STANDS ATTACHED TO HORIZONTAL VALVE WITH BY-PASS

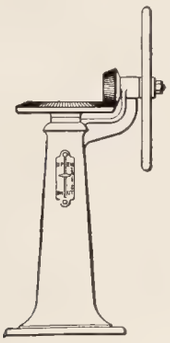
CODE: ENJOAMENTE



APPLICATION L

FOR NON-RISING STEM VALVES. BELL PATTERN FLOOR STAND FOR CLOSE QUARTERS

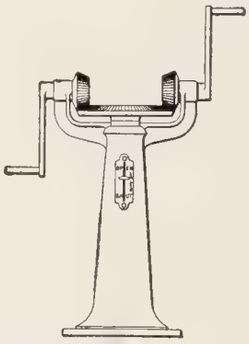
CODE: ENJONQUER



APPLICATION F

FLOOR STAND WITH SINGLE BEVEL GEARING AND HAND WHEEL

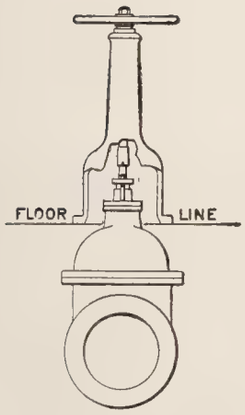
CODE: ENJOARMOS



APPLICATION G

FLOOR STAND WITH DOUBLE BEVEL GEARING AND CRANK HANDLES

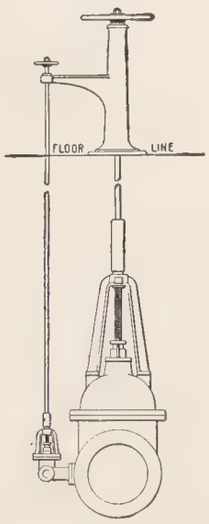
CODE: ENJOATIVO



APPLICATION J

FLOOR STAND FOR RISING STEM VALVE, BOLTED TO VALVE BONNET FOR CLOSE QUARTERS

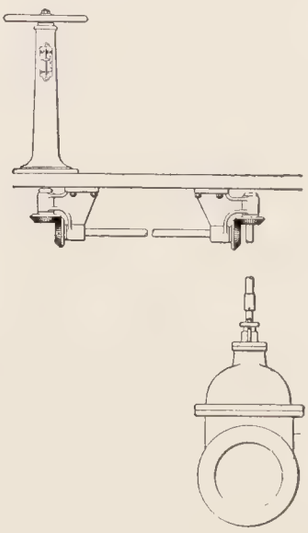
CODE: ENJOLIVEUR



APPLICATION K

FLOOR STAND WITH ARM FOR OPERATING BY-PASS

CODE: ENJONCHANT



APPLICATION H

FLOOR STAND, ATTACHED TO VERTICAL VALVE BY MITRE GEARING

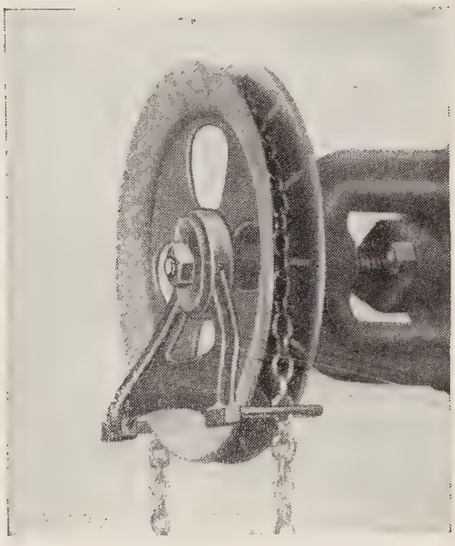
CODE: ENJOLASSES

PRICES ON APPLICATION

ALL INQUIRIES SHOULD STATE WHETHER PLAIN OR INDICATOR FLOOR STANDS ARE WANTED

FLOOR STANDS WITH ELECTRIC MOTOR DRIVE CAN BE FURNISHED

CHAIN WHEELS AND GUIDES FOR CRANE VALVES



CODE: ENKISTADO

PRICES OF CHAIN WHEELS AND GUIDES*

Pitch Diameter of Chain Wheel Inches	To fit Non-Rising Stem Gate Valves Each	To fit Rising Stem Gate Valves Each	Guides for Chain Wheels Each
3	1.50	3.50	8.50
4	1.50	3.50	8.50
5	1.75	3.75	8.50
7½	2.25	4.50	8.75
10	2.50	5.00	9.00
14	5.50	8.00	10.25
18	9.00	12.00	11.00
24	12.00	16.00	15.00
30	21.00	26.00	18.00

*Prices of Chain Wheels are extra over price of complete Valve. No allowance for regular wheel.

The prices for Guides include putting them on the Valves.

Chain Wheels for Globe and Angle Valves are same price as for Non-Rising Stem Gate Valves.

Price of Chain for Chain Wheels	per foot	.20
Price for connecting Ends of Chain	per chain	.30

In ordering Chain for Chain Wheels be sure to specify the diameter of the Wheel with which the Chain is to be used.

TABLE GIVING SIZES OF CHAIN WHEELS USED ON CRANE VALVES

Brass Valves Gates, Globes and Angles				Pitch Diameter Chain Wheel	All Valves Except Brass						
					Wedge Gates				Globes and Angles		
Standard	Medium	Extra Heavy	Hydraulic		Light	Standard Medium	Extra Heavy	800 Hyd.	Standard	Medium	Extra Heavy
1½–2	1¼–1½	1–1¼	¾–1	3							
2½–3	2–2½	1½–2	1¼–1½	4			1¼–1½				
3½	3	2½	2	5		2–2½ 3–3½	2–2½	1½	2–2½ 3–3½	2–2½	2
4	3½–4	3	2½–3	7½		4 4½–5	3–3½	2–2½	4 4½–5	3 3½–4	2½ 3–3½
				10		6–7 8–9	4 4½–5	3–3½ 4–4½	6–7	4½–5 6–7	4–4½ 5
				14	12 14–15 16–18	10–12	6–7	5	8–10	8–9	6–7
				18	20–22 24–26	14 15–16	8 9–10	6–7 8–9	12	10 12–14	8
				24	28 30–32 34–36	18–20 22–24	12–14 15–16 18–20	10–12	14 15–16 18–20		10
				30	40–42	30	24				

STANDARD MALLEABLE IRON

FLAT BAND SCREWED FITTINGS

FOR STEAM WORKING PRESSURES UP TO 150 POUNDS

MERITS OF STANDARD SCREWED FITTINGS

General satisfaction is expressed by all of our customers in the design, utility, strength and general appearance of our Standard Screwed Fittings.

In general design our Reducing Fittings are in direct proportion with the straight sizes, thus harmonizing the fittings in any combination of piping.

All fittings are recessed, permitting an easy entrance of the pipe, and are uniformly threaded to the American Briggs Standard Gauge.

These fittings are well proportioned, of good weight and suitable for the working pressures for which they are recommended.

We have, at various times, subjected these fittings to hydraulic pressures of 2,000 to 4,000 pounds, without bursting them. See illustration of twisted test bar, page 2.

LARGELY INCREASED VARIETY OF SIZES

We believe that the largely increased variety of straight and reducing sizes tabulated on pages 704 to 713 will be found sufficient to fully meet the requirements of the trade.

When it is necessary to have special fittings, we will make them.

We recommend, in most instances, the use of bushings rather than the making of special fittings.

TESTED FITTINGS

Fittings tested to 200 pounds air pressure or 250 pounds water pressure will be made to order. Prices according to quantity wanted.

STANDARD MALLEABLE IRON

PLAIN PATTERN SCREWED FITTINGS

Plain pattern fittings are generally used for low pressure gas and water, house plumbing and railing work.

Plain fittings are dipped unless otherwise ordered.

AIR BRAKE FITTINGS

We carry in stock specially tested Malleable Fittings for air brake use, as illustrated on page 324.

FOR GENERAL DIMENSIONS, SEE PAGE 640.

ELBOWS

MALLEABLE IRON

CODE: ENRHUMAMES

P. C. List

Size, Inches	1/8	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2
Size, Millimeters	3	6	10	13	19	25	32	38
Black, Straight, Each	.21	.10	.16	.20	.21	.30	.53	.70
Black, Reducing, Each		.16	.26	.26	.40	.40	.66	.88
Black, R. and L, Each		.37	.60	.94	.64	.90	1.65	2.15
Galvanized, Straight, Each	.28	.15	.23	.30	.33	.47	.82	1.15
Galvanized, Reducing, Each		.24	.37	.38	.58	.59	1.02	1.45
Galvanized, R. and L, Each		.50	.77	1.25	.95	1.30	2.30	3.20

Size, Inches	2	2 1/2	3	3 1/2	4	4 1/2	5	6
Size, Millimeters	50	64	76	90	100	113	125	150
Black, Straight, Each	1.15	2.35	3.15	5.00	6.15	11.00	13.00	19.50
Black, Reducing, Each	1.45	3.15	4.20	6.75	8.20	15.00	18.00	26.00
Black, R. and L, Each	3.55							
Galvanized, Straight, Each	1.82	3.75	5.15	8.15	9.50	18.00	21.00	31.50
Galvanized, Reducing, Each	2.30	5.00	7.00	10.85	13.00	24.00	28.00	42.00
Galvanized, R. and L, Each	5.00							

45° ELBOWS

MALLEABLE IRON

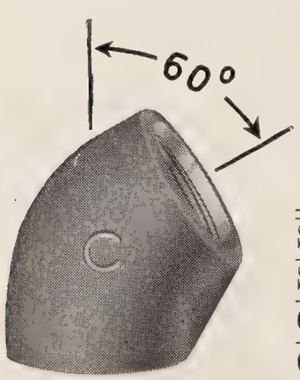
CODE: ENTANGUIDO

P. C. List

Size, Inches	1/8	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2
Size, Millimeters	3	6	10	13	19	25	32	38
45° Elbow, Black, Each	.42	.11	.17	.23	.35	.53	.88	1.15
45° Elbow, Galvanized, Each	.60	.15	.25	.34	.52	.77	1.25	1.70

Size, Inches	2	2 1/2	3	3 1/2	4	4 1/2	5	6
Size, Millimeters	50	64	76	90	100	113	125	150
45° Elbow, Black, Each	1.95	2.45	3.60	4.80	6.00	7.70	9.75	16.50
45° Elbow, Galvanized, Each	2.80	3.85	5.50	7.50	9.80	12.50	15.75	27.00

For 7-inch and larger Malleable Fittings, see page 339.



60° ELBOWS

MALLEABLE IRON

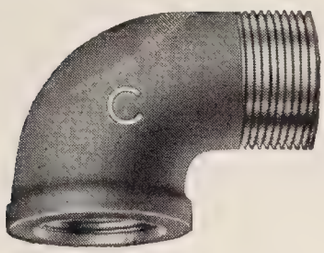
CODE: ENTELEQUIA

P. C. List

Size, Inches	1 1/4	1 1/2	2
Size, Millimeters	32	38	50
60° Elbow, Black, Each	.95	1.20	2.25
60° Elbow, Galvanized, Each	1.45	1.85	3.35

SPECIAL NOTE:—The list on all Malleable Fittings, 3/8 or 1/2-inch Reducing to 1/8-inch; 1-inch or larger Reducing to 1/2-inch or smaller will be 50 per cent added to the Reducing List.

For classification of Malleable Iron Fittings see pages 704 to 713.



STREET ELBOWS

MALLEABLE IRON

P. C. List

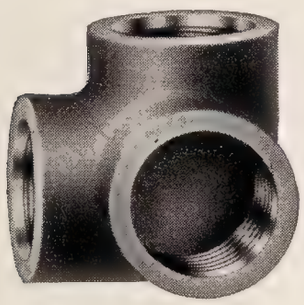
90° ELBOW
CODE: ENTENMAGE

45° ELBOW
CODE: ENTJEHEN

Size..... Inches	1/8	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2
Size..... Millimeters	3	6	10	13	19	25	32	38
90° Straight..... Each	.20	.10	.15	.24	.38	.38	.62	.85
90° Reducing..... Each					.51	.51	.83	1.15
90° Galvanized, Straight..... Each	.28	.14	.22	.35	.55	.60	1.00	1.30
90° Galvanized, Reducing..... Each					.73	.80	1.35	1.75

Size..... Inches	2	2 1/2	3	3 1/2	4	5	6
Size..... Millimeters	50	64	76	90	100	125	150
90° Straight..... Each	1.45	2.70	4.40	5.90	7.70	14.00	21.00
90° Reducing..... Each	1.95	3.60	5.45		10.00		
90° Galvanized, Straight..... Each	2.30	4.20	6.90	9.50	12.50	22.00	32.00
90° Galvanized, Reducing..... Each	3.05	5.60	9.20		17.00		

Size..... Inches	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4
Size..... Millimeters	6	10	13	19	25	32	38	50	64	76	90	100
45° Black..... Each	.29	.44	.21	.32	.52	.85	1.15	2.00		6.00		10.00
45° Galvanized..... Each	.41	.57	.31	.47	.75	1.20	1.65	2.75		8.25		14.50



CODE: ENTMAGDEN

SIDE OUTLET ELBOWS

MALLEABLE IRON

P. C. List

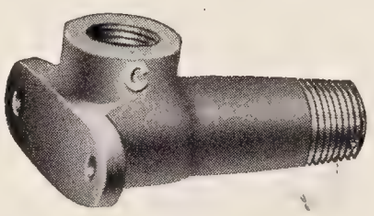
Size..... Inches	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2
Size..... Millimeters	6	10	13	19	25	32	38	50
Straight..... Each	.20	.30	.40	.75	1.10	1.95	2.50	4.10
Reducing..... Each		.42	.56	1.05	1.55	2.70	3.50	5.75
Galvanized, Straight.. Each	.30	.47	.67	1.20	1.70	2.95	3.75	6.40
Galvanized, Reducing. Each		.65	.95	1.70	2.40	4.20	5.25	9.00

FEMALE
CODE: ENTOLDANDO

DROP ELBOWS

MALLEABLE IRON

P. C. List

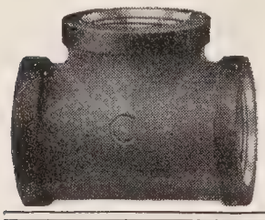


LONG
CODE: ENTRANCADO

Size..... Inches	1/4	3/8	1/2	3/4
Size..... Millimeters	6	10	13	19
Black Female Drop Ells, Straight..... Each	.24	.29	.44	.82
Black Female Drop Ells, Reducing..... Each		.40	.60	1.10
Galvanized Female Drop Ells, Straight..... Each	.37	.44	.66	1.25
Galvanized Female Drop Ells, Reducing..... Each		.60	.90	1.75
Black Male and Female Drop Ells, Straight..... Each	.38	.38	.56	
Black Male and Female Drop Ells, Reducing..... Each		.50	.80	
Galvanized Male and Female Drop Ells, Straight..... Each	.55	.55	.85	
Galvanized Male and Female Drop Ells, Reducing..... Each		.75	1.20	
Black Long Male and Female Drop Ells, Straight..... Each		.45	.70	
Black Long Male and Female Drop Ells, Reducing..... Each		.65	1.00	
Galvanized Long Male and Female Drop Ells, Straight..... Each		.70	1.05	
Galvanized Long Male and Female Drop Ells, Reducing..... Each		1.00	1.45	

SPECIAL NOTE:—The list on all Malleable Fittings 3/8 or 1/2-inch Reducing to 1/8-inch; 1-inch or larger Reducing to 1/2-inch or smaller will be 50 per cent added to the Reducing List.

For classification of Malleable Iron Fittings, see pages 704 to 713.



TEES

MALLEABLE IRON

STRAIGHT AND REDUCING

CODE: ENTRATELLA

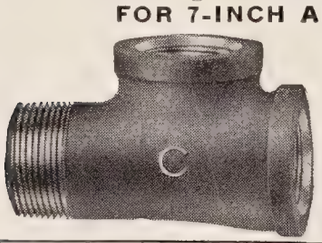
P. C. List

Size.....Inches	⅛	¼	⅜	½	¾	1	1¼	1½
Size.....Millimeters	3	6	10	13	19	25	32	38
Black, Straight.....Each	.29	.14	.22	.28	.29	.42	.80	.95
Black, Reducing.....Each		.22	.35	.35	.55	.53	1.00	1.15
Galvanized, Straight.....Each	.40	.22	.34	.40	.45	.66	1.25	1.50
Galvanized, Reducing.....Each		.35	.55	.56	.78	.82	1.60	1.90

Size.....Inches	2	2½	3	3½	4	4½	5	6
Size.....Millimeters	50	64	76	90	100	113	125	150
Black, Straight.....Each	1.60	3.05	5.00	6.30	8.45	13.00	16.00	21.00
Black, Reducing.....Each	2.00	4.10	6.25	8.40	11.00	17.25	21.00	28.00
Galvanized, Straight.....Each	2.40	4.90	8.00	10.75	13.00	20.50	25.00	36.00
Galvanized, Reducing.....Each	3.00	6.50	10.65	14.50	17.00	27.00	33.50	48.00

Parties desiring R. and L. Tees will state, when ordering, which hole is to be tapped left hand. Such goods can always be furnished to order.

FOR 7-INCH AND LARGER MALLEABLE IRON FITTINGS SEE PAGE 339.



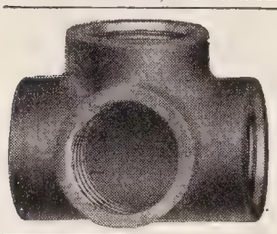
SERVICE TEES

MALLEABLE IRON

CODE: EPISTATHMI

P. C. List

Size.....Inches	¼	⅜	½	¾	1	1¼	1½	2	2½	3
Size.....Millimeters	6	10	13	19	25	32	38	50	64	76
Black, Straight.....Each	.15	.29	.32	.53	.55	.85	1.25	1.70	3.75	5.40
Black, Reducing.....Each	.20	.40	.43	.68	.75	1.15	1.70	2.30	5.00	7.20
Galvanized, Straight.....Each	.28	.50	.60	1.00	1.10	1.35	2.10	2.70	5.10	7.30
Galvanized, Reducing.....Each	.37	.68	.80	1.35	1.50	1.80	2.80	3.60	6.80	9.75



FOUR WAY TEES

MALLEABLE IRON

CODE: EPIXANTHE

P. C. List

Size.....Inches	⅜	½	¾	1	1¼	1½	2
Size.....Millimeters	10	13	19	25	32	38	50
Black.....Each	.38	.60	.90	1.35	2.25	2.95	4.85
Galvanized.....Each	.60	.90	1.50	2.00	3.30	4.30	7.45

DROP TEES

MALLEABLE IRON

CODE: EPOLLICATE

P. C. List

½, ¾ and 1-inch male and female, also 1-inch female Drop Tees, are made only in the reducing sizes shown on page 710.

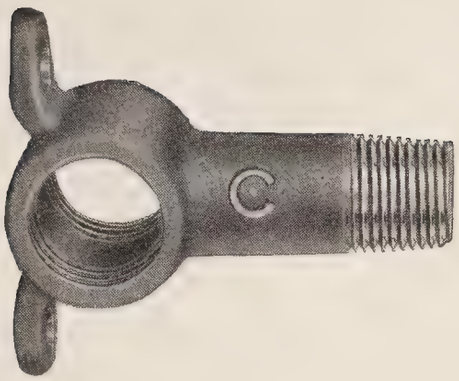
Size.....Inches	⅜	½	¾	1
Size.....Millimeters	10	13	19	25
Black, Female Drop Tee, Straight.....Each	.32	.56	.85	.90
Black, Female Drop Tee, Reducing.....Each	.45	.78	1.20	1.25
Galvanized, Female Drop Tee, Straight.....Each	.48	.85	1.25	1.40
Galvanized, Female Drop Tee, Reducing.....Each	.67	1.20	1.75	1.95

MALE AND FEMALE

Size.....Inches	⅜	½	¾	1
Size.....Millimeters	10	13	19	25
Black, Male and Female Drop Tee, Straight.....Each	.29	.35	.55	.85
Black, Male and Female Drop Tee, Reducing.....Each	.40	.50	.78	1.20
Galvanized, Male and Female Drop Tee, Straight.....Each	.45	.55	.80	1.35
Galvanized, Male and Female Drop Tee, Reducing.....Each	.63	.78	1.12	1.70

SPECIAL NOTE;—The list on all Malleable Fittings ⅜ or ½-inch Reducing to ⅛-inch; 1-inch and larger Reducing to ½-inch or smaller will be 50% added to the Reducing list.

For Classification of Malleable Iron Fittings, see pages 704 to 713.

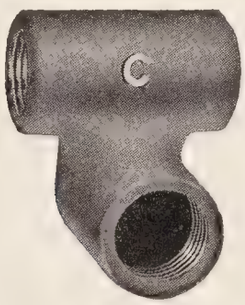


CODE: EPOTAVISTI

LONG
DROP TEES
MALLEABLE IRON
P. C. List

Size....Inches	3/8	1/2	3/4	1	1 1/4
Size....Millimeters	10	13	19	25	32
Black, Straight or Reducing....Each	.40		.95	1.30	1.85
Galvanized, Straight or Reducing....Each	.60		1.40	1.90	2.80

WASH TRAY TEES
MALLEABLE IRON
P C. List

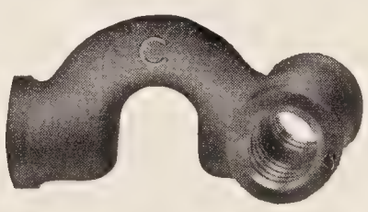


CODE: EPOUVANTAS

Size....Inches	1/2	3/4
Size....Millimeters	13	19
Galvanized Wash Tray Fitting, Straight....Each	.25	.30
Galvanized Wash Tray Fitting, Reducing....Each		.30

CROSS OVERS
MALLEABLE IRON

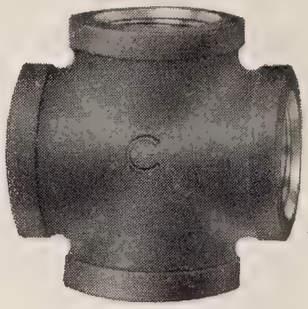
CROSS OVERS
CODE: EPTILENE



CROSS OVER TEES
CODE: EPULAREMUR

Size....Inches	1/2	3/4	1
Size....Millimeters	13	19	25
Price, Cross Overs....Each	.20	.30	.45
Price, Cross Overs, Galvanized....Each	.25	.40	.60
Price, Cross Over Tees, Galvanized....Each	.38	.56	

For Classification of Malleable Iron Fittings, see pages 704 to 713.



CROSSES

MALLEABLE IRON

CODE: EPULONISMO

P. C. List

Size.....Inches	⅛	¼	⅜	½	¾	1	1¼	1½
Size.....Millimeters	3	6	10	13	19	25	32	38
Black, Straight.....Each	.32	.19	.32	.50	.82	1.12	1.22	1.55
Black, Reducing.....Each		.42	.43	.67	1.10	1.40	1.53	2.05
Galvanized, Straight.....Each	.45	.28	.50	.72	1.20	1.60	1.95	2.55
Galvanized, Reducing.....Each		.60	.67	.96	1.60	2.50	2.60	3.40

Size.....Inches	2	2½	3	3½	4	4½	5	6
Size.....Millimeters	50	64	76	90	100	113	125	150
Black, Straight.....Each	2.70	4.20	7.10	9.10	10.50		18.50	27.50
Black, Reducing.....Each	3.60	5.60	9.30	12.15	13.50			
Galvanized, Straight.....Each	4.20	6.60	11.50	14.75	17.00		30.00	42.50
Galvanized, Reducing.....Each	5.60	8.80	14.30	19.50	22.50			

For larger size malleable crosses, see page 339.

SPECIAL NOTE;—The list on all Malleable Fittings ⅜ or ½-inch reducing to ⅛-inch; 1-inch and larger reducing to ½-inch and smaller will be 50% added to the reducing list.

REDUCERS

MALLEABLE IRON

CODE: ERJUBELST

P. C. List

Size.....Inches	¼	⅜	½	¾	1	1¼
Size.....Millimeters	6	10	13	19	25	32
Black.....Each	.19	.15	.24	.36	.42	.50
Galvanized.....Each	.32	.21	.29	.54	.60	.75

Size.....Inches	1½	2	2½	3	3½	4
Size.....Millimeters	38	50	64	76	90	100
Black.....Each	.68	1.20	1.85	3.15	4.25	5.50
Galvanized.....Each	1.10	1.85	3.25	4.80	6.25	8.75

SPECIAL NOTE;—The list on Reducers 1-inch and larger, reducing to ½-inch and smaller will be 50 per cent added to the list.

BUSHINGS

MALLEABLE IRON

REDUCING ONE SIZE ONLY

SHOULDER

CODE: ERNTEGEBER

FACE

CODE: ERNTELOHN

SHOULDER

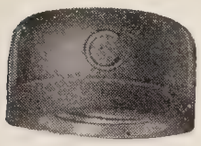
Size.....Inches	¼	⅜	½	¾	1	1¼	1½	2	2½
Size.....Millimeters	6	10	13	19	25	32	38	50	64
Price.....Each	.04	.04	.04	.05	.06	.07	.09	.14	.21
Price, Galvanized.....Each	.08	.08	.08	.10	.12	.14	.18	.28	.42

FACE

Size.....Inches	⅜	½	¾	1	1¼	1½	2	2½	3
Size.....Millimeters	10	13	19	25	32	38	50	64	76
Price.....Each	.08	.09	.11	.13	.17	.22	.32	.48	.70
Price, Galvanized.....Each	.12	.14	.17	.20	.25	.33	.48	.72	1.05

Size.....Inches	3½	4	4½	5	6	7	8	10	12
Size.....Millimeters	90	100	113	125	150	175	200	250	300
Price.....Each	1.20	1.50	2.10	2.60	3.75	8.00	9.00	14.00	20.00
Price, Galvanized.....Each	1.80	2.25	3.15	3.90	5.60				

For classification of Malleable Iron Fittings, see pages 704 to 713.



CAPS

MALLEABLE IRON

CODE: ERUBEBATIS

P. C. List

Size.....Inches	1/8	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2
Size.....Millimeters	3	6	10	13	19	25	32	38
Black.....Each	.09	.06	.09	.12	.21	.31	.39	.50
Galvanized.....Each	.12	.08	.13	.18	.31	.45	.62	.80
Size.....Inches	2	2 1/2	3	3 1/2	4	4 1/2	5	6
Size.....Millimeters	50	64	76	90	100	113	125	150
Black.....Each	.80	1.50	2.20	3.00	3.60	6.00	7.45	11.00
Galvanized.....Each	1.25	2.40	3.45	4.80	5.60	8.00	12.00	17.50

We can furnish **"HEXAGON"** Malleable Caps, sizes 1/4, 3/8 and 1/2-inch, at a special price.

For Cast Iron Caps, sizes 4-inch to 12-inch, see page 364.

STRAIGHT, BANDED

CODE: ESAUTORARE

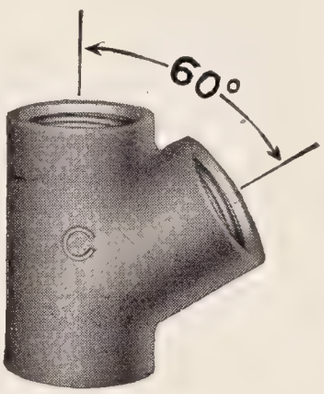
Y BENDS

(LATERAL)

MALLEABLE IRON

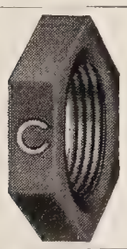
STRAIGHT AND REDUCING

P. C. List



CODE: ESCOGEDORA

Size.....Inches	3/8	1/2	3/4	1	1 1/4
Size.....Millimeters	10	13	19	25	32
Black 45° or 60° Y Bend, Straight or Reducing..Each	.23	.36	.52	.87	1.48
Galv. 45° or 60° Y Bend, Straight or Reducing...Each	.34	.53	.76	1.26	2.15
Black Dbl. 45° or 60° Y Bend, Str. or Red.....Each					2.20
Galv. Dbl. 45° or 60° Y Bend, Str. or Red.....Each					3.25
Size.....Inches	1 1/2	2	2 1/2	3	4
Size.....Millimeters	38	50	64	76	100
Black 45° or 60° Y Bend, Straight or Reducing..Each	2.05	3.20	7.90	13.00	20.00
Galv. 45° or 60° Y Bend, Straight or Reducing...Each	2.95	4.65	11.50	19.00	30.00
Black Dbl. 45° or 60° Y Bend, Str. or Red.....Each	3.05	4.80	11.80		
Galv. Dbl. 45° or 60° Y Bend, Str. or Red.....Each	4.50	7.00	17.25		



LOCK NUTS

MALLEABLE IRON

CODE: ESCOLHIDA

P. C. List

Size.....Inches	1/8	1/4	3/8	1/2	3/4	1	1 1/4
Size.....Millimeters	3	6	10	13	19	25	32
Black.....Each	.14	.06	.08	.12	.18	.29	.44
Galvanized.....Each	.18	.10	.12	.17	.26	.43	.63
Size.....Inches	1 1/2	2	2 1/2	3	3 1/2	4	
Size.....Millimeters	38	50	64	76	90	100	
Black.....Each	.46	.60	2.00	2.90	4.00	6.00	
Galvanized.....Each	.65	.95	2.60	3.70	6.00	9.75	

The threads of our Hexagon Lock Nut conform to the American Standard.

For Cast Iron Locknuts, sizes 2 1/2-inch to 12-inch, see page 364.

Special Note:—The list on all Malleable Fittings, 3/8 or 1/2-inch Reducing to 1/8-inch; 1-inch or larger Reducing to 1/2-inch or smaller will be 50% added to the Reducing List.

For Classification of Malleable Fittings, see pages 704 to 713.

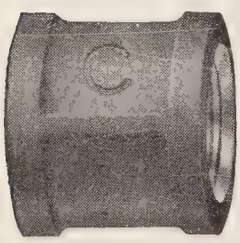
CODE: ESCONDIDAS

WASTE NUTS

MALLEABLE IRON

P. C. List

Size.....Inches	1/8	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2
Size.....Millimeters	3	6	10	13	19	25	32	38	50
Black.....Each	.27	.12	.18	.22	.36	.37	.77	1.40	1.60
Galvanized.....Each	.32	.18	.26	.36	.54	.56	1.15	2.10	2.55

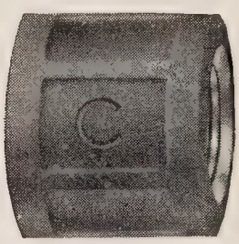


RIGHT HAND
CODE: ESCUBITORE

COUPLINGS

MALLEABLE IRON

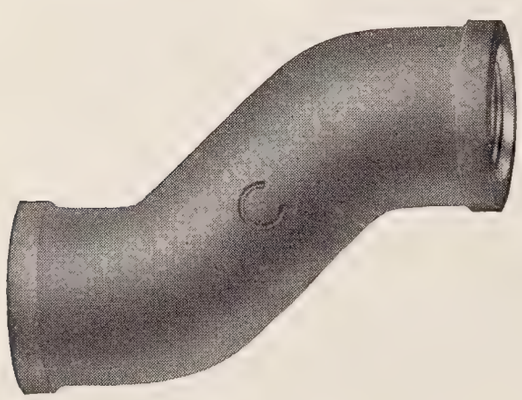
P. C. List



RIBBED RIGHT AND LEFT HAND
CODE: ESCORJANTE

Size.....Inches	1/8	1/4	3/8	1/2	3/4	1	1 1/4
Size.....Millimeters	3	6	10	13	19	25	32
Black Right Hand Coupling.....Each	.14	.12	.18	.26	.41	.42	.64
Galvanized Right Hand Coupling.....Each	.20	.17	.27	.37	.60	.62	1.00
Black Right and Left Hand Coupling....Each	.16	.15	.23	.30	.50	.52	.82
Galvanized Right and Left Hand Coupling, Ea.	.23	.21	.32	.42	.70	.72	1.25

Size.....Inches	1 1/2	2	2 1/2	3	3 1/2	4	
Size.....Millimeters	38	50	64	76	90	100	
Black Right Hand Coupling.....Each	.88	1.50	2.25	3.00	4.50	6.00	
Galvanized Right Hand Coupling.....Each	1.40	2.40	3.45	4.70	6.00	9.50	
Black Right and Left Hand Coupling....Each	1.05	1.80	2.60	3.50	....	....	
Galvanized Right and Left Hand Coupling, Ea.	1.60	2.80	4.00	5.50	....	....	



CODE: ESDRUJULA

OFFSETS

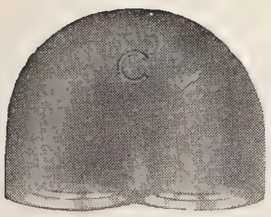
MALLEABLE IRON

Size.....Inches	3/4	1	1 1/4
Size.....Millimeters	19	25	32
Price.....Each	.25	.40	.75
Offset.....Inches	1 1/2	1 1/2	2
Length.....Inches	3 1/4	4	5 3/8

For Classification of Malleable Iron Fittings, see pages 704 to 713.

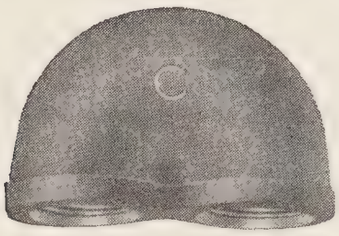
MALLEABLE IRON RETURN BENDS

P. C. List



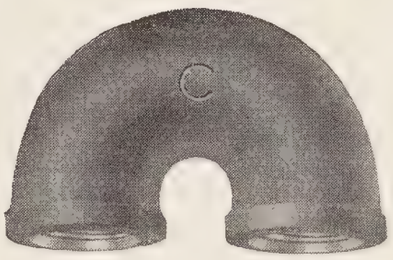
CLOSE

CODE: ESFERVELHO



MEDIUM

CODE: ESINANISCA



OPEN

CODE: ESMADRIGA

Size.....Inches	⅜	½	¾	1	1¼	1½	2
Size.....Millimeters	10	13	19	25	32	38	50
Black R. H. Close Return Bend.....Each	.90	.35	.60	.90	1.10	1.50	2.35
Black R. and L. Close Return Bend.....Each	1.10	.44	.75	1.15	1.35	1.90	2.95
Galvanized R. H. Close Return Bend.....Each	1.20	.53	.92	1.35	2.00	2.70	4.50
Galvanized R. and L. Close Return Bend.....Each	1.50	.66	1.15	1.70	2.50	3.40	5.65
Center to Center, Close Return Bend.....Inches		1	1¼	1½	1¾	2 3/16	2⅝

Size.....Inches	½	¾	1	1¼	1½	2
Size.....Millimeters	13	19	25	32	38	50
Black R. H. Medium Return Bend.....Each	.40	.60	.95	1.20	1.65	2.90
Black R. and L. Medium Return Bend.....Each	.50	.75	1.15	1.50	2.05	3.65
Galvanized R. H. Medium Return Bend.....Each	.58	.86	1.24	2.30	3.10	5.30
Galvanized R. and L. Medium Return Bend.....Each	.72	1.08	1.55	2.90	3.90	6.60
Center to Center, Medium Return Bend.....Inches	1¼	1½	1⅞	2¼	2½	3

Size.....Inches	⅜	½	¾	1	1¼	1½	2	2½	3
Size.....Millimeters	10	13	19	25	32	38	50	64	76
Black R. H. Open Return Bend..Each	1.15	.42	.80	1.15	1.50	2.30	3.55	5.45	8.00
Black R. & L. Open Return Bend.Each	1.45	.53	1.00	1.45	1.90	2.90	4.45	6.80	10.00
Galv. R. H. Open Return Bend...Each		.60	1.15	1.70	2.80	4.25	6.70	10.25	14.80
Galv. R. & L. Open Return Bend.Each		.75	1.45	2.15	3.50	5.30	8.30	13.00	18.50
Cent. to Cent. Open Return Bend..In.	1½	1½	2	2½	3	3½	4	4½	5

Close Pattern Return Bends will not make up parallel coils, as the distance, center to center, of two adjacent bends is greater than the center to center of openings of a single bend.

RETURN BENDS, SPECIAL WIDE PATTERN, RIGHT HAND

Size.....Inches	⅜	¾	¾	1	1¼	1½
Size.....Millimeters	10	19	19	25	32	38
Price.....Each	.25	1.00	1.25	1.25	1.25	2.00
Price, Galv....Each	.30	1.35	1.65	1.70	1.70	2.75
Center to Center.In.	1½	4	6	6	6	6
Size.....Inches	2	2	3	3	4	6
Size.....Millimeters	50	50	76	76	100	150
Price.....Each	3.00	4.00	5.00	5.00	8.00	16.00
Price, Galv....Each	4.00	5.00	6.50	6.50		
Center to Center.In.	5	6	7½	8	6	12

SPECIAL WIDE

CODE: ESMONCAREM

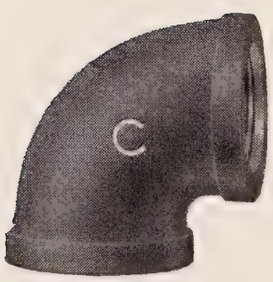
EXTRA HEAVY MALLEABLE RETURN BENDS, INFORMATION UPON REQUEST.

FOR CLASSIFICATION OF MALLEABLE IRON FITTINGS, SEE PAGES 704 TO 713.

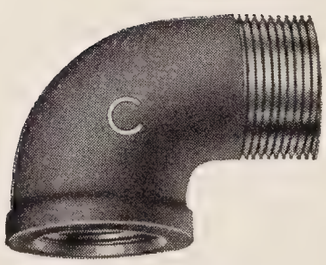
SPECIAL AIR TESTED

AIR BRAKE FITTINGS

MALLEABLE IRON



ELBOW
CODE: ESOPHAGUS



STREET ELBOW
CODE: ESORTAVAMO

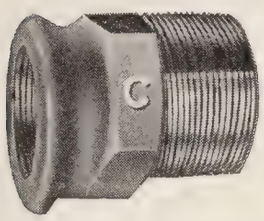
TEE
CODE: ESPABILADO

PRICE LIST ELBOWS

Size.....Inches	1/4	3/8	1/2	3/4	1	1 1/4	1 1/4x1	1 1/2
Size.....Millimeters	6	9	13	19	25	32	32x25	38
Elbow, Right Hand.....Each	.07	.08	.10	.15	.22	.25	.25	.35
Elbows, R. and L.....Each	.09	.11	.13	.17	.25	.30		.40
Street Elbows, R. H.....Each	.10	.10	.12	.20	.25	.40	.40	.55

PRICE LIST TEES

Size.....Inches	1/4	1/2	3/4x1/2x1/4	3/4x1/2x3/4	3/4x3/4x1/2	3/4	1x1x3/4	1	1 1/4	1 1/2
Size....Millimeters	6	13	19x13x6	19x13x19	19x19x13	19	25x25x19	25	32	38
Tees.....Each	.08	.11	.15	.15	.15	.15	.25	.25	.30	.45



OFFSET REDUCING COUPLINGS

MALLEABLE IRON

CODE: ESPADANADA

This fitting is the same as a Male and Female Reducer, except that the inlet and outlet are on the same level. By its use water pockets are prevented.

Size.....Inches	1x¾	1¼x1	1½x1¼	2x1½	2½x2	3x2½
Size.....Millimeters	25x19	32x25	38x32	50x38	64x50	76x64
Price.....Each	.60	.70	.90	1.10	1.80	2.50
Size.....Inches	3½x3	4x3	4x3½	4½x4	5x4	5x4½
Size.....Millimeters	90x76	100x76	100x90	113x100	125x100	125x113
Price.....Each	3.00	4.00	4.00	5.00	6.00	6.00

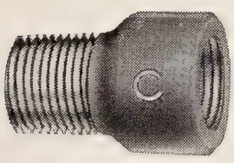
The male end is the large size.

CHANDELIER HOOKS AND LOOPS

MALLEABLE IRON

P. C. List

EXTENSION PIECE

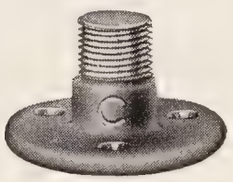


CODE: ESPADINES

CODE: ESPALDOLAS

CODE: ESPALHAVA

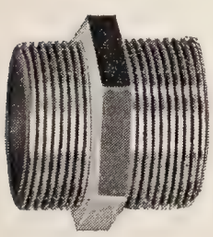
WALL PLATE



CODE: ESPALMADOR

Size.....Inches	⅜	½	¾	1	1¼	1½	2
Size.....Millimeters	10	13	19	25	32	38	50
Black Extension Pieces.....Each	.19	.33	.54	.85	1.60	2.00	3.15
Galvanized Extension Pieces....Each	.29	.50	.80	1.25	2.40	2.90	5.35
Price, Chandelier Hooks or Loops, Ea.	.17	.26	.....	.....	.....	.....	.....
Black Wall Plate.....Each	.63	.82	1.35	.....	.....	.....	.....
Galvanized Wall Plate.....Each	.93	1.20	2.00	.....	.....	.....	.....

Can furnish Male Hooks when so specified.



RIGHT AND LEFT NIPPLES WITH HEXAGON CENTERS

MALLEABLE IRON

CODE: ESPALMARON

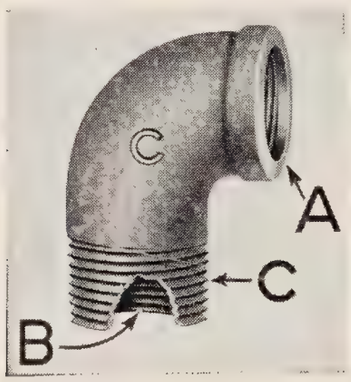
Size.....Inches	¼	⅜	½	¾	1	1¼	1½	2	2½	3	3½	4
Size.....Millimeters	6	10	13	19	25	32	38	50	64	76	90	100
Price.....Each	.20	.20	.20	.25	.30	.40	.50	.70	1.10	1.50	1.90	2.40

Right Hand Hexagon Nipples made to order at a special price.

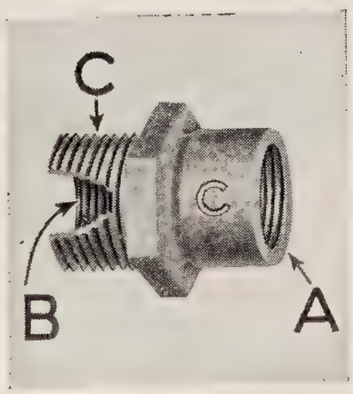
FOR CLASSIFICATION OF MALLEABLE IRON FITTINGS, SEE PAGES 704 TO 713

CIRCULATING
BOILER FITTINGS
P. C. List

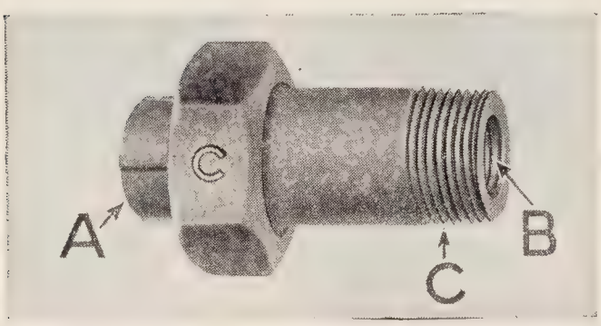
MALLEABLE IRON **GALVANIZED**



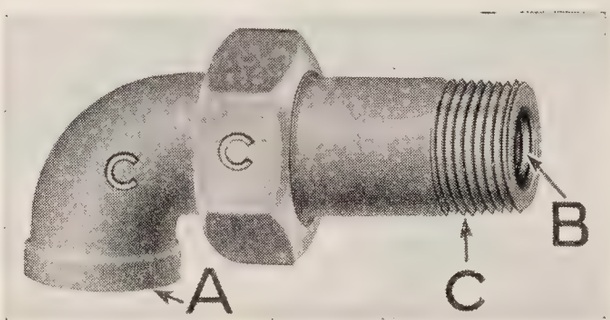
No. 587
CODE: ESPATULADO



No. 588
CODE: ESPESINHAS



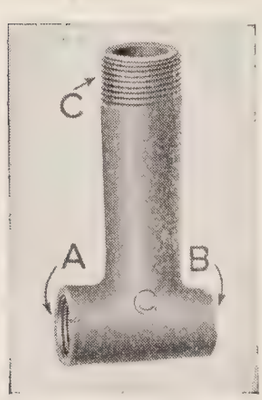
No. 589
CODE: ESPETADELA



No. 586
CODE: ESPATARD

Size ..... Inches	A B C ¾x¾x1	A B C ¾x½x1	A B C ½x½x1
Size ..... Millimeters	19x19x25	19x13x25	13x13x25
Price, Boiler Elbows, Galvanized ..... Each	.40	.40	.40
Price, Boiler Elbows, with Union, Galvanized ... Each	.75	.75	.75
Price, Boiler Coupling, Galvanized ..... Each	.40	.40	.40
Price, Boiler Coupling, with Union, Galvanized . Each	.75	.75	.75

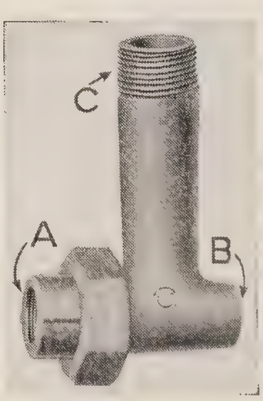
To avoid mistakes, particular care should be used in making orders quite clear for the above fittings.



CODE:
ESPETASSEM

SPECIAL PATTERN
CIRCULATING BOILER TEES
MALLEABLE IRON
GALVANIZED

Size ..... Inches	A B C ¾x½x1
Size ..... Millimeters	19x13x25
Price, without Union .... Each	.50
Price, with Union ..... Each	.80

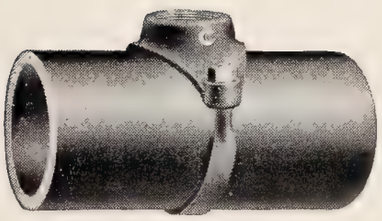


CODE:
ESPETIBILE

WATER PIPE CLAMPS

MALLEABLE IRON

WITH WROUGHT IRON STRAP



CODE: ESPEVITAR

Number	Clamps Will Fit				Size of Wrought Iron Pipe Connections Pipe Clamps are Tapped for, Inches	Price Each	Number	Clamps Will Fit				Size of Wrought Iron Pipe Connections Pipe Clamps are Tapped for, Inches	Price Each
	Outside Diameter of Circle, Inches	Size Wrought Iron Pipe, Inches	Size Outside Diameter Casing, Inches	Size Cast Iron Pipe, Inches				Outside Diameter of Circle, Inches	Size Wrought Iron Pipe, Inches	Size Outside Diameter Casing, Inches	Size Cast Iron Pipe, Inches		
0	1⅞	1½	2		½ and ¾	1.00	19	6⅝	6	6⅝		¾ to 1½	2.25
1	2⅜	2	2½		½ to 1	1.00	20	6⅝	6	6⅝		2	2.50
2	2⅞	2½	2¾ & 3	2	½ to 1¼	1.25	21	6⅝	6	6⅝		2½ and 3	5.00
3	3½	3	3½		½ to 1	1.25	22	7		7	6	¾ to 1½	2.50
4	3½	3	3½		1¼ to 2	1.50	23	7		7	6	2	2.70
5	4	3½	4	3	½ to 1	1.50	24	7		7	6	2½ and 3	5.00
6	4	3½	4	3	1¼ to 2	1.75	25	7⅝	7	7⅝		¾ to 1½	2.50
7	4½	4	4½		½ to 1½	1.75	26	7⅝	7	7⅝		2	2.70
8	4½	4	4½		2	2.00	27	7⅝	7	7⅝		2½ and 3	5.00
9	4½	4	4½		2½ and 3	4.00	28	8		8	7	¾ to 1½	4.50
10	5	4½	5	4	¾ to 1½	1.80	29	8		8	7	2	5.00
11	5	4½	5	4	2	2.15	30	8		8	7	2½ and 3	5.50
12	5	4½	5	4	2½ and 3	4.00	30½	8⅝	8	8⅝		¾ to 1½	5.50
13	5½	5	5½		¾ to 1½	1.80	31	8⅝	8	8⅝		2 to 3	5.50
14	5½	5	5½		2	2.15	32	8⅝	8	8⅝		4	6.00
15	5½	5	5½		2½ and 3	4.00	33	9⅝	9			1½ to 3	8.00
16	6		6	5	½ to 1½	2.00	34	10		10	9	¾ to 2	9.00
17	6		6	5	2	2.40	35	10¾	10			¾ to 2	9.00
18	6		6	5	2½ and 3	4.50	36	12¾	12			¾ to 2	10.00

Always order Water Pipe Clamps by number.

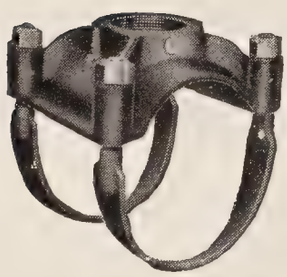
Size No. 33 has malleable iron straps.

STEAM PIPE SADDLES

MALLEABLE IRON

WITH WROUGHT STRAPS

FOR WROUGHT PIPE



CODE: EUCHITONIA

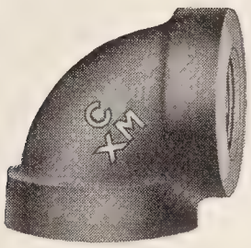
Size of Pipe....Inches	1½	2	2½	3	3½	4	4½
Size of Pipe..Millimeters	38	50	64	76	90	100	113
Tapped for Pipe Inches	½ and ¾	½ to 1½	¾ to 1½	¾ to 2	¾ to 2	¾ to 2	¾ to 2
Tapped for Pipe...Millimeters	13 and 19	13 to 38	19 to 38	19 to 50	19to50	19to50	19to50
Price.....Each	.90	1.00	1.25	1.25	1.40	1.50	2.50
Size of Pipe....Inches	5	5	6	6	7	8	9
Size of Pipe..Millimeters	125	125	150	150	175	200	225
Tapped for Pipe Inches	¾ to 2	2½ and 3	¾ to 2	2½ to 4	1 to 4	1 to 4	1½ to 4
Tapped for Pipe...Millimeters	19 to 50	64 and 76	19 to 50	64to100	25 to 100	25 to 100	38 to 100
Price.....Each	2.75	2.75	2.75	5.75	6.50	6.50	8.50
Size of Pipe....Inches	10	10	12	12	15	16	
Size of Pipe..Millimeters	250	250	300	300	375	400	
Tapped for Pipe Inches	1½ to 4	4½ to 6	1½ to 4	4½ to 6	3 to 6	3 to 6	
Tapped for Pipe...Millimeters	38 to 100	113to150	38 to 100	113 to 150	76 to 150	76 to 150	
Price.....Each	10.00	10.00	14.00	14.00	22.00	25.00	

EXTRA HEAVY

MALLEABLE IRON FITTINGS

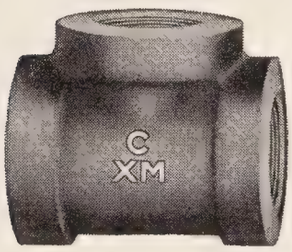
FOR STEAM WORKING PRESSURES UP TO 250 POUNDS

THESE FITTINGS ARE TESTED TO HYDRAULIC PRESSURES CORRESPONDING TO THE ABOVE WORKING PRESSURES

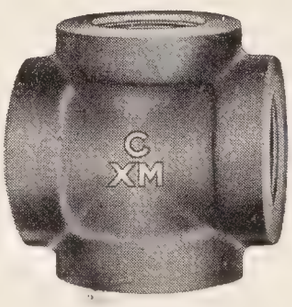


ELBOW
CODE: EUROPAMUDE

45° ELBOW
CODE: EVAGINARET



TEE
CODE: EVASISTIS



CROSS
CODE: EVIRABIMUR

Size.....Inches	¼	⅜	½	¾	1	1¼	1½
Size.....Millimeters	6	9	13	19	25	32	38
Elbows.....Each	.20	.25	.30	.35	.40	.55	.70
45° Elbows.....Each	.25	.30	.35	.42	.50	.65	.85
Tees.....Each	.30	.40	.45	.50	.60	.80	1.05
Crosses.....Each	.60	.80	.90	1.00	1.20	1.60	2.10
Size.....Inches	2	2½	3	3½	4	5	6
Size.....Millimeters	50	64	76	90	100	125	150
Elbows.....Each	.90	1.50	2.40	3.25	4.25	6.50	9.50
45° Elbows.....Each	1.10	1.85	2.85	4.00	5.00	7.50	10.50
Tees.....Each	1.35	2.25	3.60	5.00	6.50	9.75	14.25
Crosses.....Each	2.70	4.50	7.20	10.00	13.00	19.50	28.50

Galvanized Extra Heavy Malleable Fittings made to order at 50 per cent advance on above list.

45° Elbows and Crosses are not carried in stock in Reducing Sizes, but will be made to order at a special price, according to quantity wanted.

For Reducing Sizes Elbows, Tees and Reducers carried in stock, see pages 714 and 715.

Reducing Elbows and Tees carried in stock, furnished at same price as straight sizes.

For Fittings larger than 6 inches, see page 339.

See page 330 for Hydraulic Malleable Iron Fittings.

For Malleable Iron Fittings for High Pressure Air Service, see page 518.

Special Extra Heavy Malleable Iron Return Bends, page 527.

For general dimensions, see page 645.

HYDRAULIC

MALLEABLE IRON FITTINGS

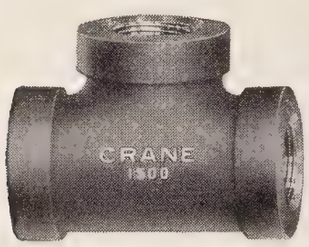
FOR COLD WATER OR OIL WORKING PRESSURES AS FOLLOWS:

1-INCH AND SMALLER, 2000 LBS. HYDROSTATIC
1¼ TO 2-INCH, 1500 LBS. HYDROSTATIC
2½ TO 4-INCH, 1000 LBS. HYDROSTATIC
5 AND 6- NCH, 800 LBS. HYDROSTATIC
THESE FITTINGS ARE TESTED TO HYDRAULIC PRESSURES CORRESPONDING TO THE ABOVE WORKING PRESSURES

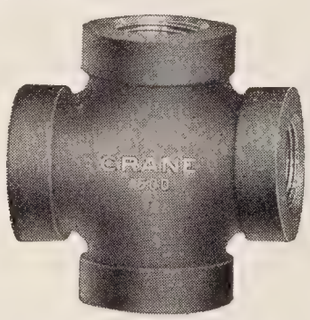
No. 260H
ELBOW
CODE: EWEGOWAN

No. 262H
45° ELBOW
CODE: EXAMBITIUS

No. 263H
LONG SWEEP ELBOW
CODE: EXAMPLEXOR



No. 264H TEE
CODE: EXANIMATAM



No. 266H CROSS
CODE: EXCUSABUNT

No. 267H REDUCER
CODE: EXFEBRUABO

Size ..... Inches	¼	⅜	½	¾	1	1¼	1½
Size ..... Millimeters	6	9	13	19	25	32	38
Elbows, No. 260 H ..... Each	.20	.25	.30	.35	.40	.55	.70
45° Elbows, No. 262 H ..... Each	.25	.30	.35	.42	.50	.65	.85
L. S. Elbows, No. 263 H ..... Each					.64	.80	1.10
Tees, No. 264 H ..... Each	.30	.40	.45	.50	.60	.80	1.05
Crosses, No. 266 H ..... Each	.60	.80	.90	1.00	1.20	1.60	2.10
Reducers, No. 267 H ..... Each		.25	.28	.30	.40	.45	.55

Size ..... Inches	2	2½	3	3½	4	5	6
Size ..... Millimeters	50	64	76	90	100	125	150
Elbows, No. 260 H ..... Each	.90	1.50	2.40	3.25	4.25	6.50	9.50
45° Elbows, No. 262 H ..... Each	1.10	1.85	2.85	4.00	5.00	7.50	10.50
L. S. Elbows, No. 263 H ..... Each	1.60	2.40	4.50	6.50	7.00	13.00	17.50
Tees, No. 264 H ..... Each	1.35	2.25	3.60	5.00	6.50	9.75	14.25
Crosses, No. 266 H ..... Each	2.70	4.50	7.20	10.00	13.00	19.50	28.50
Reducers, No. 267H ..... Each	.70	1.30	2.25				

WORKING PRESSURES

These Fittings are suitable for the working pressures specified above when used in hydraulic installations in which shock is absent or so slight as to be negligible. WHEN SUBJECT TO SHOCK they are NOT recommended for these pressures. See explanatory notes on page 175.

AIR OR GAS

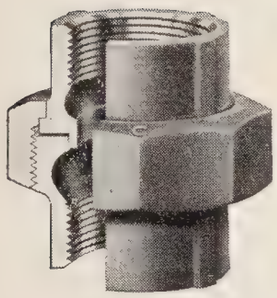
Fittings for Air or Gas are SPECIAL. See explanatory notes on page 175.
For fittings larger than 6 inches see page 339.
Long Sweep Elbows, 45° Elbows and Crosses are not carried in stock in Reducing Sizes, but will be made to order by bushing in the sand from the Straight Patterns, at a special price, according to quantity wanted.
For Reducing Sizes Elbows, Tees and Reducers carried in stock, see page 715.
Reducing Elbows and Tees carried in stock, furnished at same price as straight sizes.
For general dimensions, see page 646.

STANDARD UNIONS

MALLEABLE IRON

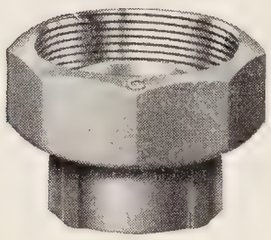
FOR STEAM WORKING PRESSURES UP TO 150 POUNDS

GASKET TYPE — GASKET EXTRA



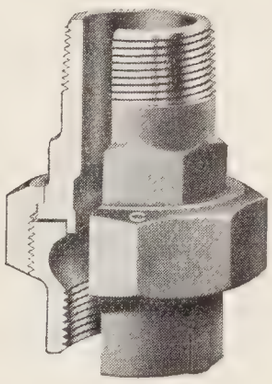
FEMALE UNION

CODE: EXGURGITO



FEMALE TWO-THIRD UNION

CODE: EXHILARANS



MALE AND FEMALE UNION

CODE: EXLAIBIMOS

Size.....Inches	1/8	1/4	3/8	1/2	3/4	1	1 1/4
Size.....Millimeters	3	6	10	13	19	25	32
Female Union, Black.....Each	.18	.18	.20	.22	.27	.33	.46
Female Union, Galvanized.....Each	.27	.27	.30	.33	.40	.50	.70
Male and Female Union, Black.....Each		.23	.25	.28	.33	.40	.57
Male and Female Union, Galvanized...Each		.32	.35	.39	.46	.57	.81
Female Two-Thirds Union.....Each		.12	.14	.16	.19	.22	.30
Female Two-Third Union, Galvanized..Each		.18	.20	.22	.25	.35	.50

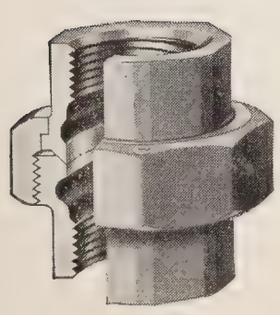
Size.....Inches	1 1/2	2	2 1/2	3	3 1/2	4
Size.....Millimeters	38	50	64	76	90	100
Female Union, Black.....Each	.58	.75	1.55	2.10	3.65	4.35
Female Union, Galvanized.....Each	.90	1.15	2.35	3.15	5.50	6.50
Male and Female Union, Black.....Each	.72	.95	1.95			
Male and Female Union, Galvanized...Each	1.04	1.35	2.75			
Female Two-Third Union, Black.....Each	.40	.50	1.00	1.40	2.40	3.00
Female Two-Third Union, Galvanized..Each	.60	.75	1.60	2.10	3.70	4.35

STANDARD ALL-IRON UNIONS

MALLEABLE IRON

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS

GROUND JOINT FOR STEAM — NO GASKET REQUIRED



No. 518 1/2

CODE: EXOBRUATUR

Size.....Inches	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3
Size..Millimeters	6	9	13	19	25	32	38	50	64	76
No. 518 1/2 Blk. Ea.	.18	.20	.22	.27	.33	.46	.58	.75	1.55	2.10
No. 518 1/2 Galv. Ea.	.27	.30	.33	.40	.50	.70	.90	1.15	2.35	3.15

All-Iron Unions are for use on Steam, Oil and Gas and on Air Lines. Also for use on Acid Lines where All-Iron material is serviceable.

MALLEABLE IRON

BRASS TO IRON SEAT UNIONS

MALLEABLE ENDS. MALLEABLE OCTAGON RING.
OUR BRASS TO IRON SEAT UNIONS HAVE BEEN EXAMINED AND TESTED BY THE UNDERWRITERS' LABORATORIES AND LISTED BY THE CONSULTING ENGINEERS OF THE NATIONAL BOARD OF FIRE UNDERWRITERS.

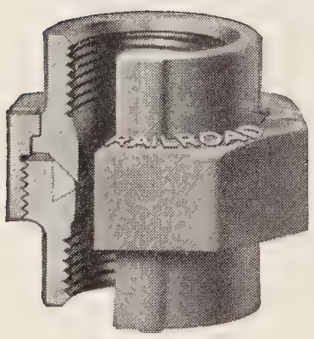
RAILROAD UNIONS

NO. 519

FOR STEAM WORKING PRESSURES AS FOLLOWS:

⅛ TO 3-INCH, INCLUSIVE, 250 POUNDS
3½ AND 4-INCH, 200 POUNDS

TESTED TO 250 POUNDS HYDRAULIC PRESSURE



NO. 519
FEMALE ENDS
CODE: EXOLABATIS

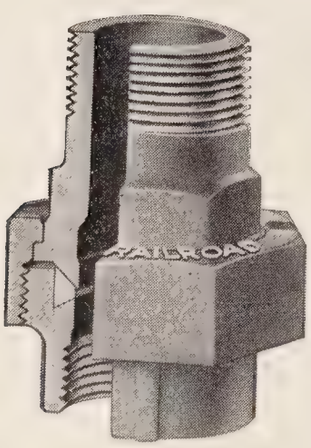
Size.....Inches	⅛	¼	⅜	½	¾	1	1¼
Size.....Millimeters	3	6	10	13	19	25	32
Price.....Each	.30	.30	.40	.50	.60	.80	1.20
Price, Galvd...Each	.45	.45	.60	.75	.90	1.20	1.80

Size.....Inches	1½	2	2½	3	3½	4
Size.....Millimeters	38	50	64	76	90	100
Price.....Each	1.60	2.00	3.20	4.80	8.00	10.00
Price, Galvd...Each	2.40	3.00	4.80	7.20	12.00	15.00

NO. 519½

FOR STEAM WORKING PRESSURES UP TO 200 POUNDS

TESTED TO 250 POUNDS HYDRAULIC PRESSURE



NO. 519½
MALE AND FEMALE ENDS
CODE: EXOPORTON

Size.....Inches	¼	⅜	½	¾	1
Size.....Millimeters	6	10	13	19	25
Price.....Each	.38	.50	.62	.75	1.00
Price, Galvanized.....Each	.53	.70	.87	1.05	1.40

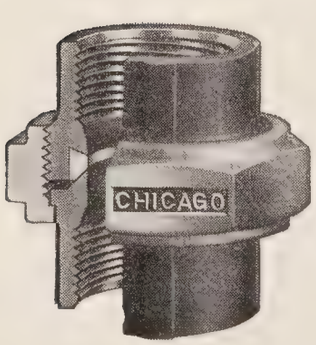
Size.....Inches	1¼	1½	2	2½	3
Size.....Millimeters	32	38	50	64	76
Price.....Each	1.50	2.00	2.50	4.00	6.00
Price, Galvanized.....Each	2.10	2.80	3.50	5.60	8.40

CHICAGO UNIONS

WITH BRASS HEXAGON RING

FOR STEAM WORKING PRESSURES UP TO 200 POUNDS

TESTED TO 250 POUNDS HYDRAULIC PRESSURE



NO. 515
CODE: EXPENSURIS

Size.....Inches	¼	⅜	½	¾	1
Size.....Millimeters	6	10	13	19	25
Price.....Each	.19	.22	.27	.40	.48
With Galvanized Ends....Each	.23	.26	.34	.49	.60

Size.....Inches	1¼	1½	2	2½	3
Size.....Millimeters	32	38	50	64	76
Price.....Each	.66	.80	1.14	2.10	2.65
With Galvanized Ends....Each	.82	1.10	1.40	2.75	3.50

The brass seat ring is forced into place by special machinery and cannot loosen.
The seats are ground in, so that a tight joint is obtained.
The brass to iron seat eliminates the use of gaskets.

MALLEABLE IRON

UNIONS

NAVY

OCTAGON ENDS

BRASS TO IRON SEAT

GROUND JOINT — NO GASKET REQUIRED

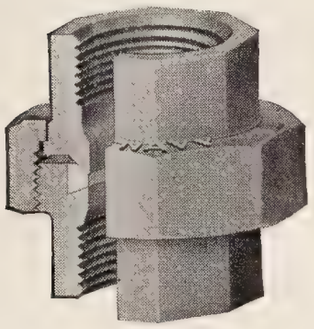
EXTRA HEAVY

FOR STEAM WORKING PRESSURES AS FOLLOWS:

¼ TO 2-INCH, INCLUSIVE, 300 POUNDS
2½ AND 3-INCH, 250 POUNDS

TESTED TO 300 POUNDS HYDRAULIC PRESSURE

CRANE NAVY UNIONS WITH BRASS TO IRON SEAT HAVE BEEN EXAMINED AND TESTED BY THE UNDERWRITERS' LABORATORIES AND LISTED BY THE CONSULTING ENGINEERS OF THE NATIONAL BOARD OF FIRE UNDERWRITERS.



No. 98 E
CODE: EXPILANDUM

Size.....Inches	¼	⅜	½	¾	1
Size.....Millimeters	6	10	13	19	25
Price.....Each	.30	.40	.50	.60	.80
Price, Galvanized.....Each	.45	.60	.75	.90	1.20
Size.....Inches	1¼	1½	2	2½	3
Size.....Millimeters	32	38	50	64	76
Price.....Each	1.20	1.60	2.00	3.20	4.80
Price, Galvanized.....Each	1.80	2.40	3.00	4.80	7.20

The brass ring is forced into place by special machinery and cannot loosen.

The seats are ground in, so that a tight joint is obtained.

The brass to iron seat eliminates the use of gaskets.

Brass to brass seats will be made to order at a special price.

We also furnish Extra Heavy Cast Iron Navy Flange Unions, No. 99E of similar construction, as shown on page 411.

ALL-IRON UNIONS

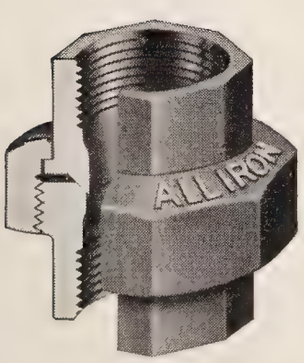
MALLEABLE IRON

GROUND JOINT — OCTAGON ENDS — NO GASKET REQUIRED

EXTRA HEAVY

FOR STEAM WORKING PRESSURES AS FOLLOWS:

¼ TO 2-INCH, INCLUSIVE, 300 POUNDS
2½ AND 3-INCH, 250 POUNDS



No. 98½ E
CODE: EXPLAYANLA

Size.....Inches	¼	⅜	½	¾	1
Size.....Millimeters	6	9	13	19	25
Price.....Each	.30	.40	.50	.60	.80
Price, Galvanized.....Each	.45	.60	.75	.90	1.20
Size.....Inches	1¼	1½	2	2½	3
Size.....Millimeters	32	38	50	64	76
Price.....Each	1.20	1.60	2.00	3.20	4.80
Price, Galvanized.....Each	1.80	2.40	3.00	4.80	7.20

All-Iron unions are for use on Steam, Oil, Gas and on Air Lines. Also for use on Acid Lines where All-Iron material is serviceable.

RAILROAD UNION ELBOWS

BRASS TO IRON SEAT

GROUND JOINT
NON-CORROSIVE

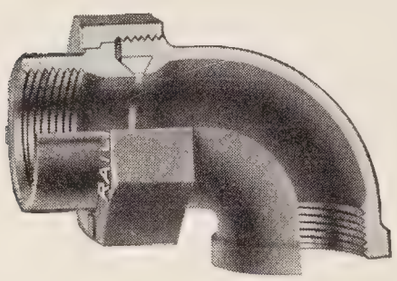
NO GASKET REQUIRED
READILY TAKEN APART

MALLEABLE IRON

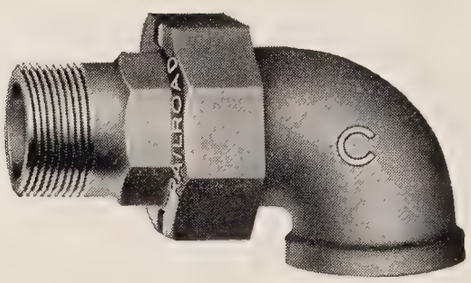
FOR STEAM WORKING PRESSURES UP TO 200 POUNDS

TESTED TO 250 POUNDS HYDRAULIC PRESSURE

OUR BRASS TO IRON SEAT RAILROAD UNION ELBOWS HAVE BEEN EXAMINED AND TESTED BY THE UNDERWRITERS' LABORATORIES AND LISTED BY THE CONSULTING ENGINEERS OF THE NATIONAL BOARD OF FIRE UNDERWRITERS.

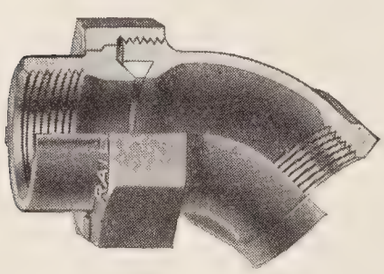


No. 590 ELBOW
WITH FEMALE UNION
CODE: EXPLOSIVOS



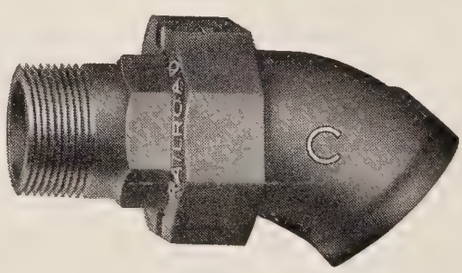
No. 592 ELBOW
WITH MALE UNION
CODE: EXPONETIS

Size.....Inches	¼	⅜	½	¾	1	1¼	1½	2	2½	3
Size.....Millimeters	6	9	13	19	25	32	38	50	64	76
Price, No. 590, Elbow. Each	.45	.60	.75	.90	1.20	1.80	2.40	3.00	4.80	7.50
Price, No. 590, Galv. . Each	.60	.80	1.00	1.20	1.60	2.40	3.20	4.00	6.40	10.00
Price, No. 592, Elbow. Each	.45	.60	.75	.90	1.20	1.80	2.40	3.00	4.80	
Price, No. 592, Galv. . Each	.60	80	1.00	1.20	1.60	2.40	3.20	4.00	6.40	



No. 591 ELBOW
WITH FEMALE UNION
CODE: EXPREMIAM

45° ELBOWS



No. 593 ELBOW
WITH MALE UNION
CODE: EXPROPIAD

Size.....Inches	¼	⅜	½	¾	1	1¼	1½	2
Size.....Millimeters	6	9	13	19	25	32	38	50
Price, No. 591, Elbow.....Each	.45	.60	.75	.90	1.20	1.80	2.40	3.00
Price, No. 591, Galvanized.....Each	.60	.80	1.00	1.20	1.60	2.40	3.20	4.00
Price, No. 593, Elbow.....Each	.45	.60	.75	.90	1.20	1.80	2.40	3.00
Price, No. 593, Galvanized.....Each	.60	.80	1.00	1.20	1.60	2.40	3.20	4.00

THESE FITTINGS ARE OF THE SAME CONSTRUCTION AS OUR RAILROAD UNIONS SHOWN ON PAGE 332, COMBINING ALL THE ADVANTAGES AND FEATURES OF MERIT THAT HAVE MADE THESE UNIONS THE STANDARD ON MANY RAILROADS. THE CONSTANTLY GROWING DEMAND IS OUR STRONGEST RECOMMENDATION.

FOR GENERAL DIMENSIONS, SEE PAGE 641

RAILROAD UNION TEES

BRASS TO IRON SEAT

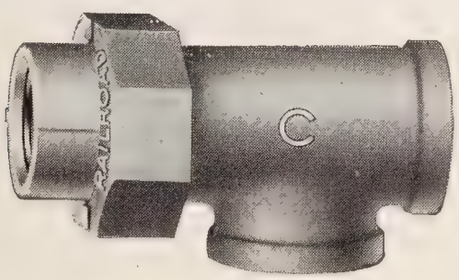
GROUND JOINT — NO GASKET REQUIRED
NON-CORROSIVE — READILY TAKEN APART

MALLEABLE IRON

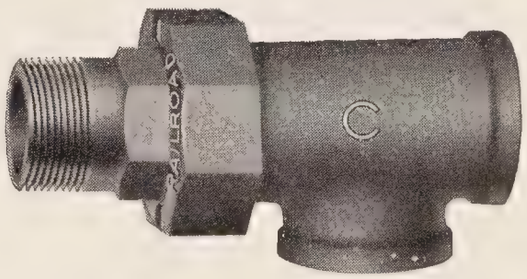
FOR STEAM WORKING PRESSURES UP TO 200 POUNDS

TESTED TO 250 POUNDS HYDRAULIC PRESSURE

OUR BRASS TO IRON SEAT RAILROAD UNION TEES HAVE BEEN EXAMINED AND TESTED BY THE UNDERWRITERS' LABORATORIES AND LISTED BY THE CONSULTING ENGINEERS OF THE NATIONAL BOARD OF FIRE UNDERWRITERS.



NO. 594 TEE
WITH FEMALE UNION
CODE: FACEDERO

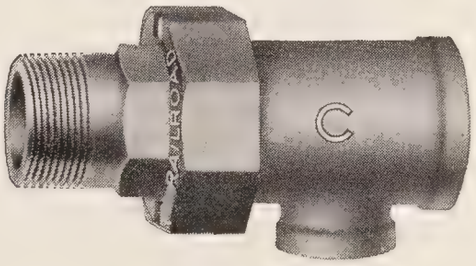


NO. 596 TEE
WITH MALE UNION
CODE: FACHASSENT

Size.....Inches	¼	⅜	½	¾	1	1¼	1½	2	2½
Size.....Millimeters	6	10	13	19	25	32	38	50	64
Price, No. 594, Tee.....Each	.50	.66	.82	1.00	1.32	1.98	2.64	3.30	5.30
Price, No. 594, Galvanized...Each	.67	.88	1.10	1.32	1.75	2.65	3.50	4.40	7.10
Price, No. 596, Tee.....Each	.50	.66	.82	1.00	1.32	1.98	2.64	3.30	5.30
Price, No. 596, Galvanized...Each	.67	.88	1.10	1.32	1.75	2.65	3.50	4.40	7.10

REDUCING RAILROAD UNION TEES

NO. 595
WITH FEMALE UNION
CODE: FACTARETUR



NO. 597
WITH MALE UNION
CODE: FACTURABAS

Size.....Inches	1x⅜	1x½	1x¾
Size.....Millimeters	25x10	25x13	25x19
No. 595 Tee.....Each	1.45	1.45	1.45
No. 595, Galvanized.....Each	1.95	1.95	1.95
No. 597 Tee.....Each	1.45	1.45	1.45
No. 597, Galvanized.....Each	1.95	1.95	1.95

THESE FITTINGS ARE OF THE SAME CONSTRUCTION AS OUR RAILROAD UNIONS SHOWN ON PAGE 332 COMBINING ALL THE ADVANTAGES AND FEATURES OF MERIT THAT HAVE MADE THESE UNIONS THE STANDARD ON MANY RAILROADS. THE CONSTANTLY GROWING DEMAND IS OUR STRONGEST RECOMMENDATION.

FOR GENERAL DIMENSIONS, SEE PAGE 641

RAILROAD UNION TEES

BRASS TO IRON SEAT

MALLEABLE IRON

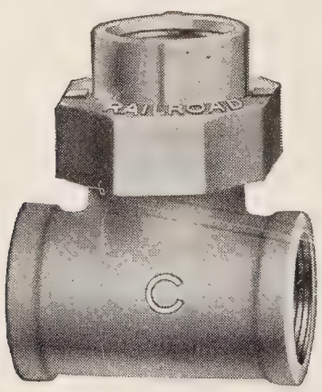
GROUND JOINT
NON-CORROSIVE

NO GASKET REQUIRED
READILY TAKEN APART

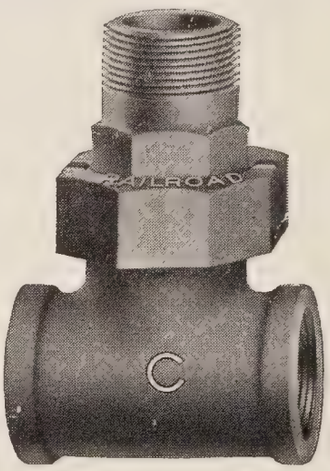
FOR STEAM WORKING PRESSURES UP TO 200 POUNDS

TESTED TO 250 POUNDS HYDRAULIC PRESSURE

OUR BRASS TO IRON SEAT RAILROAD UNION TEES HAVE BEEN EXAMINED AND TESTED BY THE UNDERWRITERS' LABORATORIES AND LISTED BY THE CONSULTING ENGINEERS OF THE NATIONAL BOARD OF FIRE UNDERWRITERS.



No. 598
WITH FEMALE UNION ON OUTLET
CODE: FADEJASTES



No. 598½
WITH MALE UNION ON OUTLET
CODE: FADIGADOR

Size.....Inches	¼	⅜	½	¾	1	1¼	1½	2
Size.....Millimeters	6	10	13	19	25	32	38	50
No. 598, Black.....Each	.70	.75	.82	1.00	1.32	1.98	2.64	3.30
No. 598, Galvanized.....Each	.90	1.00	1.10	1.32	1.75	2.65	3.50	4.40
No. 598½, Black.....Each	.70	.75	.82	1.00	1.32	1.98	2.64	3.30
No. 598½, Galvanized....Each	.90	1.00	1.10	1.32	1.75	2.65	3.50	4.40

FOR DIMENSIONS SEE PAGE 641

PUMP STUD UNIONS

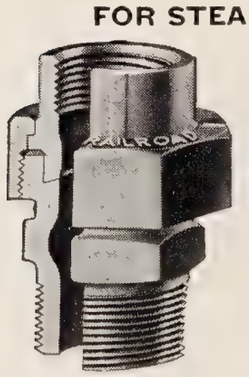
BRASS TO IRON SEAT

GROUND JOINT
NON-CORROSIVE

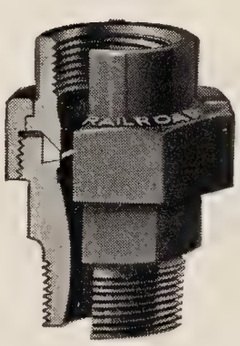
NO GASKET REQUIRED
READILY TAKEN APART

MALLEABLE IRON

FOR STEAM WORKING PRESSURES UP TO 200 POUNDS



No. 517 REDUCING
CODE: FAGIUOLATA



No. 517½ STRAIGHT
CODE: FAHLAUGIG

No. 517 REDUCING

Size.....Inches	1x¾	1¼x1	1½x1¼	2x1	2x1¼	2x1½
Size.....Millimeters	25x19	32x25	38x32	50x25	50x32	50x38
Price, Black.....Each	.90	1.20	1.80	2.40	2.40	2.40
Price, Galvanized.....Each	1.20	1.60	2.40	3.20	3.20	3.20

No. 517½ STRAIGHT

Size.....Inches	1¼	1½	2
Size.....Millimeters	32	38	50
Price, Black.....Each	1.65	2.25	2.75
Price, Galvanized.....Each	2.30	3.10	3.85

No. 517. The male end is one pipe size larger than the female.
No. 517½. The male end is the same size as the female.

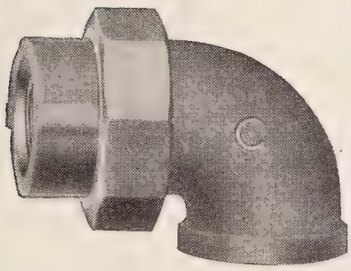
GASKET TYPE

UNION ELBOWS

MALLEABLE IRON

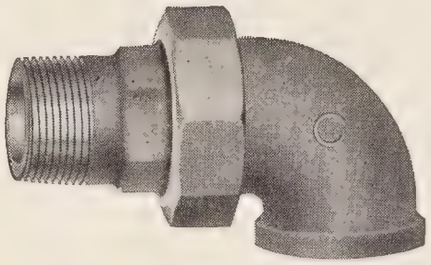
FOR STEAM WORKING PRESSURES UP TO 150 POUNDS

GASKETS EXTRA



WITH FEMALE UNION

CODE: FAHRBILLET



WITH MALE UNION

CODE: FAHRSCHIFF

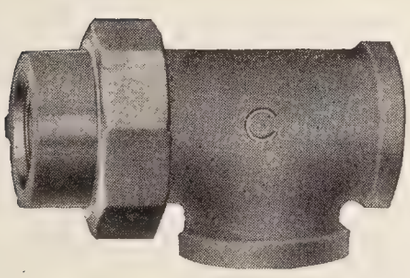
Size.....Inches	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2
Size.....Millimeters	6	10	13	19	25	32	38	50	64
Price, with Female Union.....Each	.38	.40	.42	.54	.63	.90	1.05	1.55	2.85
Price, with Female Union, Galv. Each	.57	.60	.63	.81	.95	1.35	1.58	2.35	4.30
Price, with Male Union.....Each	.43	.45	.48	.62	.72	1.05	1.20	1.80	3.30
Price, with Male Union, Galv....Each	.65	.70	.72	.93	1.08	1.60	1.80	2.70	4.95

UNION TEES

MALLEABLE IRON

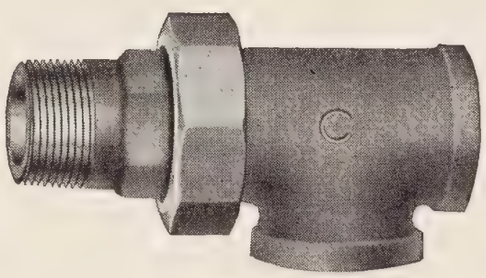
FOR STEAM WORKING PRESSURES UP TO 150 POUNDS

GASKETS EXTRA



WITH FEMALE UNION

CODE: FALDIGLIA



WITH MALE UNION

CODE: FALKENAUGE

Size.....Inches	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2
Size.....Millimeters	6	10	13	19	25	32	38	50	64
Price, with Female Union.....Each	.40	.43	.45	.57	.70	.95	1.15	1.70	3.20
Price, with Female Union, Galv.Each	.60	.65	.68	.86	1.05	1.45	1.75	2.55	4.80
Price, with Male Union.....Each	.48	.50	.52	.65	.80	1.10	1.30	1.95	3.70
Price, with Male Union, Galv...Each	.72	.75	.78	1.00	1.20	1.65	1.95	2.95	5.55

FOR BRASS TO IRON SEAT UNION ELBOWS AND TEES, SEE PAGES 334 TO 336

FOR GENERAL DIMENSIONS, SEE PAGE 641

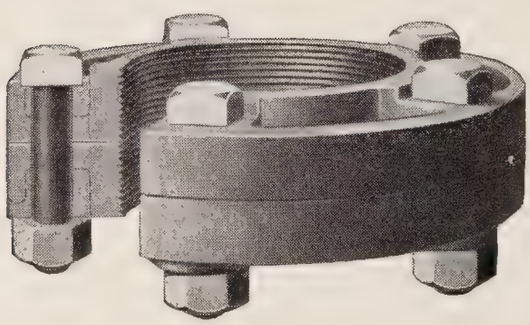
MALLEABLE IRON

GASKET TYPE FLANGE UNIONS

STANDARD

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS

FACED GASKET EXTRA



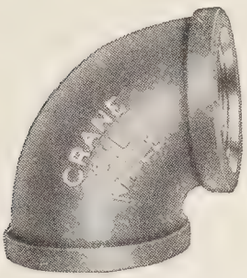
CODE: FAMAGOSTA

Size	Inches	3/4	1	1 1/4	1 1/2	2
Size	Millimeters	19	25	32	38	50
Price	Each	1.40	1.60	2.00	2.50	3.00
Price, Galvanized	Each	2.80	3.20	4.00	5.00	6.00
Diameter Flanges	Inches	2 7/8	3 1/4	3 3/4	4 5/8	5 1/2
Number of Bolts		3	4	4	4	4
Size	Inches	2 1/2	3	3 1/2	4	4 1/2
Size	Millimeters	64	76	90	100	113
Price	Each	3.50	4.40	5.25	6.00	7.00
Price, Galvanized	Each	7.00	8.80	10.50	12.00	14.00
Diameter Flanges	Inches	6	6 3/4	7 1/2	8	8 5/8
Number of Bolts		4	4	4	5	5
Size	Inches	5	6	8		
Size	Millimeters	125	150	200		
Price	Each	8.00	9.00	18.00		
Price, Galvanized	Each	16.00	18.00	36.00		
Diameter Flanges	Inches	9 3/8	10 5/8	13 1/8		
Number of Bolts		5	6	7		

CRANE SPECIAL MALLEABLE FITTINGS

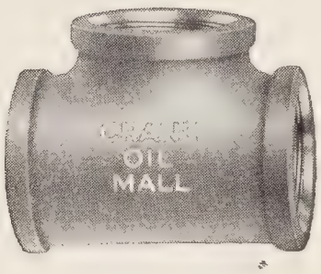
FOR OIL, GAS AND OIL REFINERY USE

STANDARD REFINERY PATTERNS FOR 200-POUNDS OIL WORKING PRESSURE

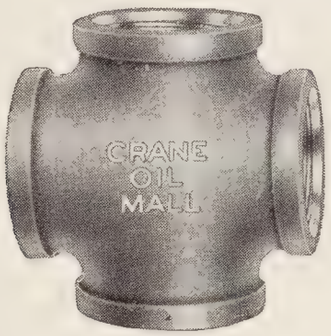


No. 760—ELBOW
CODE: FAMULARIUS

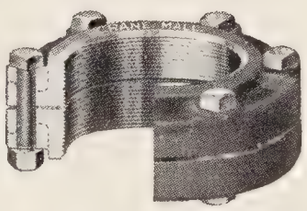
No. 762—45° ELBOW
CODE: FANATARUM



No. 764—TEE
CODE: FANCORAL



No. 766—CROSS
CODE: FARSALICO



No. 771—FLANGE UNION
CODE: FARSURARUM

Made in sizes 2-inch to 12-inch. Reducing Tees in prevailing Refinery sizes.

HEAVY PATTERN

For use on High Pressure Cold Oil, Gas and Water lines. Also for Hot Oil, Vapor and Steam lines.

Sizes 12-inch and smaller for Oil Working Pressures from 600 to 2,000 pounds, depending on the size.

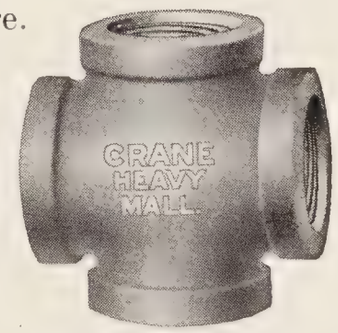
No. 95-E Flange Unions for 400-pound Oil Working Pressure.

No. 245-H Flange Unions for 800-pound Oil Working Pressure.

No. 260-E—ELBOW
CODE: FASANVOGEL

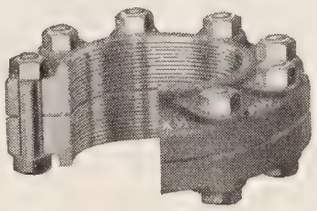
No. 262-E—45° ELBOW
CODE: FASENACKT

No. 264-E—TEE
CODE:FASQUIANSE

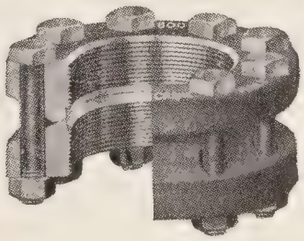


No. 266-E—CROSS
CODE: FATILEGA

No. 267-E—REDUCER
CODE: FAUCHAISON



No. 95-E—FLANGE UNION
CODE: FAULCONS



No. 245-H—FLANGE UNION
CODE: FAULSTELLE

Made in sizes ¼-inch to 16-inch.

Reducing Fittings in prevailing Field and Refinery sizes.

The two lines of Fittings shown on this page are particularly adapted for the exacting requirements of the oil industry. All Fittings have long Pipe Line thread lengths and heavier bands than the commercial fitting.

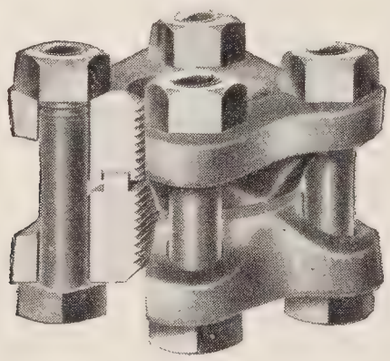
Prices and information on request.

HYDRAULIC FLANGE UNIONS TONGUE AND GROOVE

FOR OIL, GAS OR COLD WATER WORKING PRESSURES AS FOLLOWS:
¼-INCH TO 2-INCH, 2000 POUNDS HYDROSTATIC
2½-INCH TO 4-INCH, 1000 POUNDS HYDROSTATIC

THESE UNIONS ARE TESTED ON WATER TO THE HYDROSTATIC PRESSURES GIVEN ABOVE

WITH GASKET

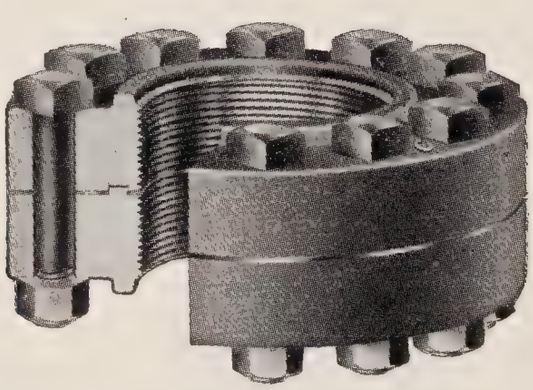


No. 239 H MALLEABLE IRON
CODE: FAUQUETTE

Size....Inches	¼	⅜	½	¾	1	1¼
Size....Millimeters	6	10	13	19	25	32
Price including Gasket....Each	1.35	1.35	1.50	1.50	1.50	1.75
Outside Diameter	3	3⅜	3½	3⅜	3⅞	4 13/16
Number of Bolts	2	2	2	4	4	4
Size....Inches	1½	2	2½	3	3½	4
Size....Millimeters	38	50	64	76	90	100
Price including Gasket....Each	2.25	3.00	6.00	9.00	11.50	14.00
Outside Diameter	5 5/16	6¼	6¾	7⅞	8⅞	9
Number of Bolts	4	4	4	4	4	6

FOR 1000 POUNDS OIL, GAS AND WATER WORKING PRESSURE

GASKET EXTRA

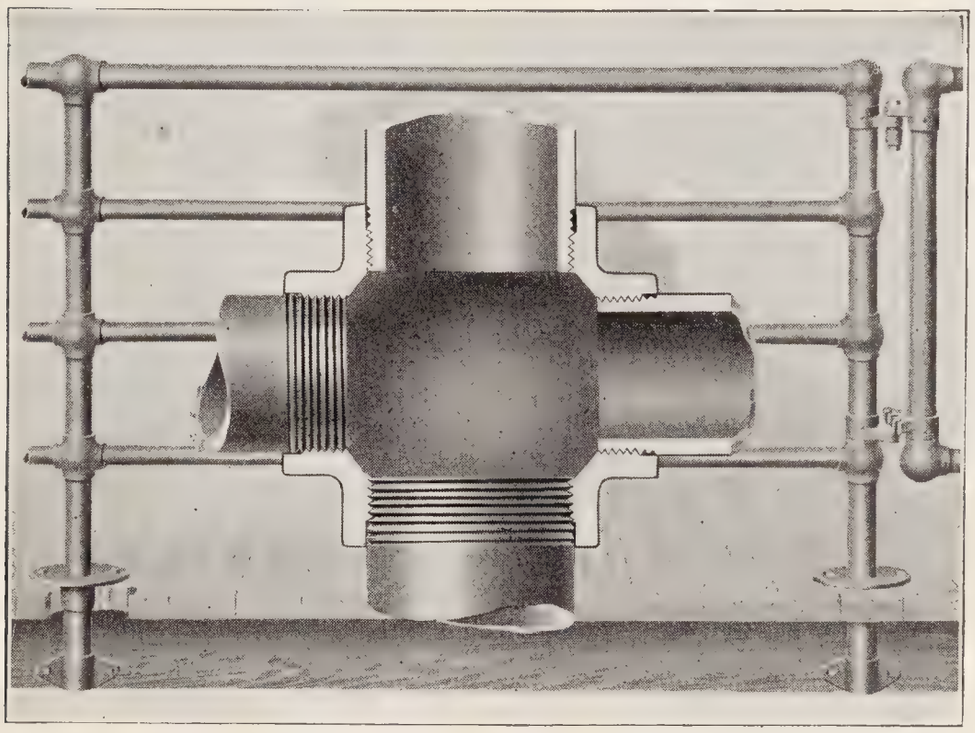


No. 247 H FERROSTEEL
CODE: FAUSTULUS

Size....Inches	3	4	6	8	10	12
Size....Millimeters	76	100	150	200	250	300
Price....Each	26.00	35.00	82.00	100.00	152.00	185.00
Outside Diameter	8½	10¾	14	16½	20	22
Number of Bolts	8	8	12	12	16	20

RAILING FITTINGS

MADE OF MALLEABLE IRON, ALSO OF FINISHED BRASS



THE ABOVE ILLUSTRATION SHOWS OUR RAILING FITTINGS WITH ENDS RECESSED

The advantage of the Recess in the Fitting is, it admits an easy entrance of the pipe and allows it to screw into the Fitting beyond the line of thread, thus entirely covering the thread and making a much neater and stronger job.

Fittings will be Reamed for Slip Joints, when so specified, at an additional price. Inquiries and orders should be accompanied by sketches showing clearly which openings are to be so reamed.

MALE THREADS

Railing Pipe Threads should have approximately the following lengths:

Size.....Inches	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4
Thread Length.....Inches	7/16	1/2	9/16	9/16	9/16	5/8	3/4	3/4	3/4	3/4

In the field solid dies for male threads may be used. When cutting these threads, the solid die should be run on the pipe to between two and three threads of the face of the die.

OUR LARGE VARIETY OF PATTERNS ENABLES US TO FURNISH RAILING FITTINGS THAT WILL COVER ALL REQUIREMENTS AND SPECIFICATIONS

IN ORDERING, DESCRIBE KIND WANTED BY NUMBER AND SIZE.
BLACK WILL ALWAYS BE FURNISHED UNLESS GALVANIZED IS SPECIFIED

FOR BRASS RAILING FITTINGS SEE PAGE 83

BALL PATTERN

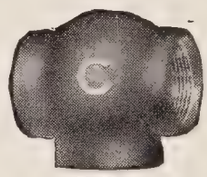
RAILING FITTINGS

P. C. List

MALLEABLE IRON — FOR ALL PURPOSES

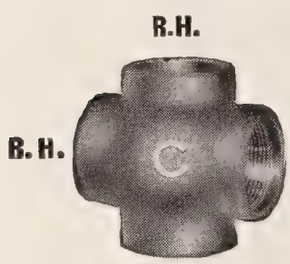
R.H.
No. 1
CODE:
FAVAGGINE

R.H.
No. 2
CODE:
FAVORIAMO

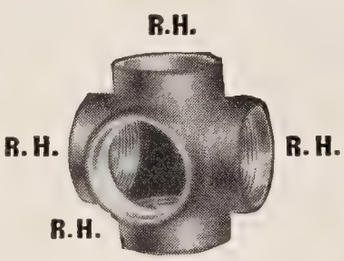


R.H.
No. 3
CODE:
FECONDOSO

R.H.
No. 4
CODE:
FEFELLERAT



R.H.
No. 5
CODE:
FELDISPATO



R.H.
No. 6
CODE:
FELDSENF

No. 7
CODE:
FEMSCHOFFE

L.H.
No. 8
CODE:
FENDETTERO

Pipe Size.....Inches	⅜	½	¾	1	1¼	1½	2	2½	3	4
Pipe Size.....Millimeters	10	13	19	25	32	38	50	64	76	100
No. 1, Elbow.....Each		.15	.20	.25	.35	.45	.75	1.60	2.25	4.50
No. 2, Elbow Side Outlet....Each		.20	.25	.30	.40	.50	.80	1.75	2.50	5.00
No. 3, Tee.....Each		.20	.25	.30	.40	.50	.80	1.75	2.50	5.00
No. 4, Tee Side Outlet.....Each		.30	.35	.40	.50	.60	1.00	1.90	2.60	5.25
No. 5, Cross.....Each		.30	.35	.40	.50	.60	1.00	1.80	2.60	5.25
No. 6, Cross Side Outlet.....Each		.35	.40	.45	.55	.75	1.35	2.00	2.75	5.50
No. 7, Floor Flange, Square..Each		.25	.30	.35	.45	.50	.70	1.35	2.50	5.00
No. 8, Ball Ornament.....Each		.16	.18	.20	.25	.35	.90	1.35	2.00	4.25

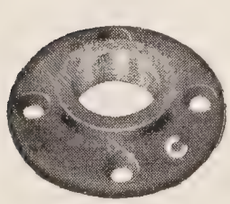
For Railing Fittings with Adjustable or Special Angles, see pages 346 to 349.

For Reducing Railing Fittings, see page 343.

Railing Fittings will be furnished tapped, as shown in cuts, or Right Hand on all openings when so specified, at regular prices. Tapped otherwise will be charged at 15 per cent additional net. Orders for fittings to be tapped special should be accompanied by a sketch.

Fittings will be Reamed for Slip Joints, when so specified, at an additional price. Inquiries and orders should be accompanied by sketches showing clearly which openings are to be so reamed.

In ordering specify catalogue number and size.



CODE: FENILICO

FLOOR FLANGES

CAST IRON

COUNTERSUNK HOLES FOR SCREWS

NOT FACED

Size.....Inches	⅜x3	½x3½	¾x3½	1x4	1¼x4	1½x4½	2x5½
No. 9, Round Flange, Black.....Each	.20	.30	.32	.34	.44	.60	.70

ADD 50 PER CENT TO ABOVE PRICES FOR GALVANIZED RAILING FITTINGS

FOR BRASS RAILING FITTINGS, SEE PAGE 83

BALL PATTERN

REDUCING RAILING FITTINGS

MALLEABLE IRON **FOR ALL PURPOSES**

REDUCING ELBOWS, No. 1

Size.....Inches	1¼x1	1½x1¼	2x1¼	2x1½	2½x2	3x2½
Size.....Millimeters	32x25	38x32	50x32	50x38	64x50	76x64
Price.....Each	.40	.52	.82	.82	1.85	2.60

REDUCING SIDE OUTLET ELBOWS, No. 2

Size.....Inches	1¼x1x1	1½x1¼x1¼	2x1¼x1¼
Size.....Millimeters	32x25x25	38x32x32	50x32x32
Price.....Each	.46	.58	.92
Size.....Inches	2x1½x1½	2½x2x2	3x2½x2½
Size.....Millimeters	50x38x38	64x50x50	76x64x64
Price.....Each	.92	2.00	2.90

REDUCING TEES, No. 3

Size.....Inches	1x1x1¼	1¼x1¼x1	1¼x1¼x1½
Size.....Millimeters	25x25x32	32x32x25	32x32x38
Price.....Each	.46	.46	.58
Size.....Inches	1½x1½x1¼	1¼x1¼x2	1½x1½x2
Size.....Millimeters	38x38x32	32x32x50	38x38x50
Price.....Each	.58	.85	.85
Size.....Inches	2x2x1¼	2x2x1½	2x2x2½
Size.....Millimeters	50x50x32	50x50x38	50x50x64
Price.....Each	.85	.85	2.00
Size.....Inches	2½x2½x2	2½x2½x3	3x3x2½
Size.....Millimeters	64x64x50	64x64x76	76x76x64
Price.....Each	2.00	2.90	2.90

REDUCING SIDE OUTLET TEES, No. 4

Size.....Inches	1¼x1¼x1x1	1½x1½x1¼x1¼	2x2x1¼x1¼
Size.....Millimeters	32x32x25x25	38x38x32x32	50x50x32x32
Price.....Each	.52	.63	1.05
Size.....Inches	2x2x1½x1½	2½x2½x2x2	3x3x2½x2½
Size.....Millimeters	50x50x38x38	64x64x50x50	76x76x64x64
Price.....Each	1.05	2.20	3.00

*REDUCING CROSSES, No. 5

Size.....Inches	1¼x1¼x1x1	1½x1½x1¼x1¼	2x2x1¼x1¼
Size.....Millimeters	32x32x25x25	38x38x32x32	50x50x32x32
Price.....Each	.52	.67	1.15
Size.....Inches	2x2x1½x1½	2½x2½x2x2	3x3x2½x2½
Size.....Millimeters	50x50x38x38	64x64x50x50	76x76x64x64
Price.....Each	1.15	2.10	3.00

REDUCING SIDE OUTLET CROSSES, No. 6

Size.....Inches	2x2x1½x1½x1½
Size.....Millimeters	50x50x38x38x38
Price.....Each	1.55

*Reducing Crosses are always tapped with one end of large run left hand.

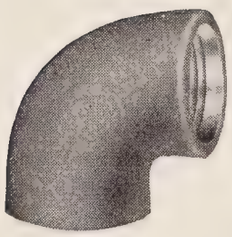
ADD 50 PER CENT TO ABOVE PRICES FOR GALVANIZED RAILING FITTINGS

Reducing Fittings will always be tapped same as straight sizes, unless otherwise ordered.

PLAIN PATTERN

RAILING FITTINGS

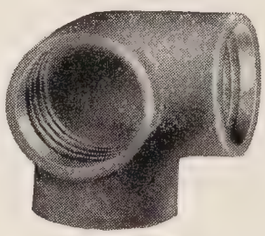
MALLEABLE IRON



R. H.

NO. 61

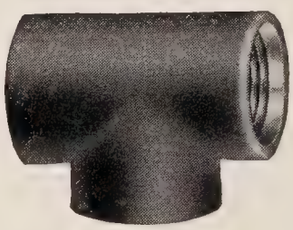
CODE: FESCHESTE



R. H.

NO. 62

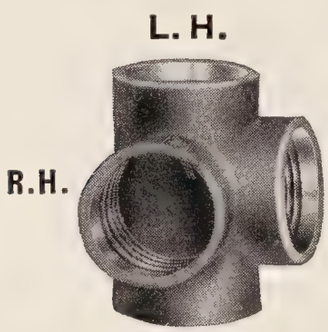
CODE: FESTEJABAN



R. H.

NO. 63

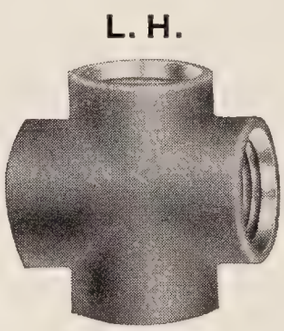
CODE: FEUARDENT



R. H.

NO. 64

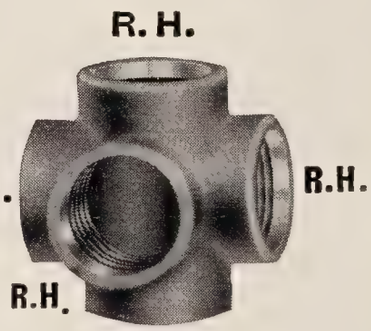
CODE: FEUERGERAT



R. H.

NO. 65

CODE: FEUERODEM



R. H.

NO. 66

CODE: FEUERWEDEL

Pipe Size.....Inches	¾	1	1¼	1½	2	2½	3
Pipe Size.....Millimeters	19	25	32	38	50	64	76
No. 61, Elbow, Black.....Per Pound	.12	.12	.12	.12	.12	.12	.12
No. 61, Elbow, Galvanized.....Per Pound	.19	.19	.19	.19	.19	.19	.19
No. 62, Elbow, Side Outlet, Black.....Per Pound	.20	.20	.20	.20	.20	.20	.20
No. 62, Elbow, Side Outlet, Galvanized..Per Pound	.28	.28	.28	.28	.28	.28	.28
No. 63, Tee, Black.....Per Pound	.12	.12	.12	.12	.12	.12	.12
No. 63, Tee, Galvanized.....Per Pound	.19	.19	.19	.19	.19	.19	.19
No. 64, Tee, Side Outlet, Black.....Per Pound	.20	.20	.20	.20	.20	.20	.20
No. 64, Tee, Side Outlet, Galvanized.....Per Pound	.28	.28	.28	.28	.28	.28	.28
No. 65, Cross, Black.....Per Pound	.20	.20	.12	.12	.12	.12	.12
No. 65, Cross, Galvanized.....Per Pound	.28	.28	.19	.19	.19	.19	.19
No. 66, Cross, Side Outlet, Black.....Per Pound	.20	.20	.20	.20	.20	.20	.20
No. 66, Cross, Side Outlet, Galvanized...Per Pound	.28	.28	.28	.28	.28	.28	.28

Fittings larger than 2-inch are made to order only.

Fittings will be furnished tapped, as shown in cuts, or Right Hand on all openings when so specified, at regular price. Tapped otherwise will be charged at 15 per cent additional, net.

Reducing sizes will be made to order at a special price, and unless otherwise specified, will be tapped same as straight Fittings, as shown in above cuts.

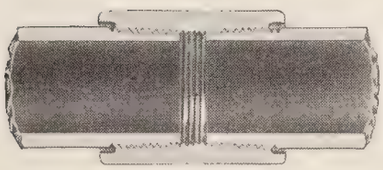
Fittings will be Reamed for Slip Joints, when so specified, at an additional price. Inquiries and orders should be accompanied by sketches showing clearly which openings are to be so reamed.

IN ORDERING, SPECIFY CATALOGUE NUMBER AND SIZE

BLACK WILL ALWAYS BE FURNISHED UNLESS GALVANIZED IS SPECIFIED

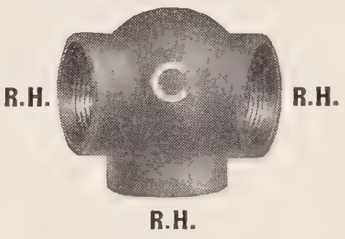
AUXILIARY RAILING FITTINGS

MALLEABLE IRON

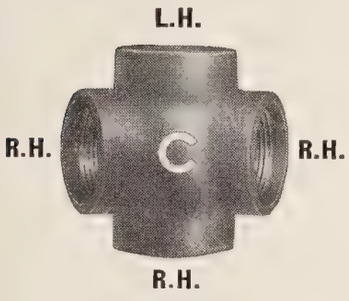


NO. 9 RECESSED COUPLING
CODE: FICULNEAM

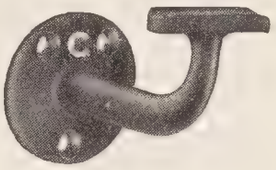
NO. 10
CODE: FIDEFRAGUS



NO. 11
CODE: FIGADINHO

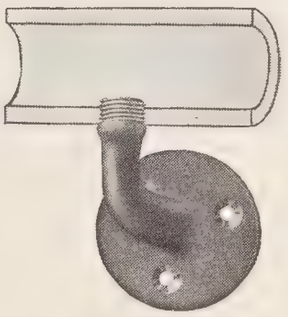


NO. 12
CODE: FIGNESSIMO

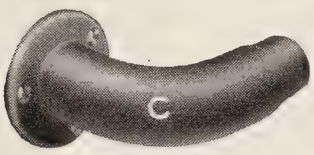


NO. 50
CODE: FIGURANDAS

NO. 55
CODE: FILARDEAUX



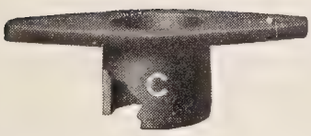
NO. 15
CODE: FIGUROSOS



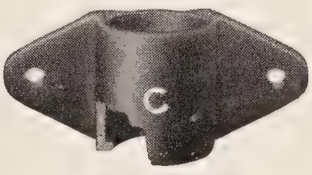
NO. 52
CODE: FIJNVROOM

NO. 56
CODE: FILOTESIA

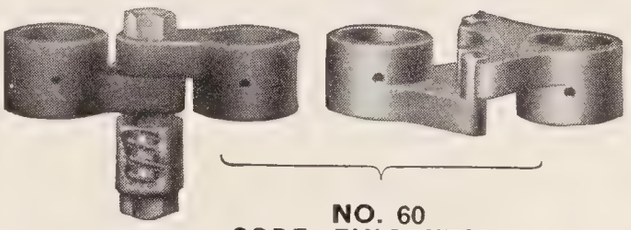
NO. 57
CODE: FIMATOSIS



NO. 58
CODE: FINANZJAHR



NO. 59
CODE: FINDELOHN



NO. 60
CODE: FINGENTIA

FOR APPLICATION OF Nos. 58, 59 AND 60, SEE PAGE 341.

Pipe Size.....Inches	1	1¼	1½	2
Size.....Millimeters	25	32	38	50
No. 9, Recessed Pipe Coupling.....Each	.35	.45	.55	.70
No. 9, Recessed Pipe Coupling, Galv.....Each	.40	.55	.70	.90
No. 10, Floor Flange, Long Base.....Each	.30	.60	.75	1.25
No. 11, 45° Side Outlet Elbow.....Each	.50	.70	.90	1.50
No. 12, 45° Side Outlet Tee.....Each	.55	.75	1.00	1.60
No. 50, Stair Rail Bracket.....Each	.35	.35	.35	.35
No. 51, Stair Rail Bracket.....Each	.45	.45	.45	.45
No. 52, Stair Rail Bracket Elbow.....Each		1.10	1.30	
No. 55, Loafer Rail (Cast Iron) 18-in. long....Each	.30	.30	.30	.30
No. 56, Hitching Post Caps, Male.....Each			.35	
No. 57, Hitching Post Caps, Female.....Each			.40	.90
No. 58, Board Walk Flange.....Each	.35	.40	.50	.65
No. 59, Board Walk Bracket.....Each	.35	.40	.50	.65
No. 60, Self-Closing Gate Hinge.....Per Set	3.00	3.00	3.75	4.75
No. 60, Self-Closing Gate Hinge, Galv.....Per Set	3.75	3.75	5.00	6.50

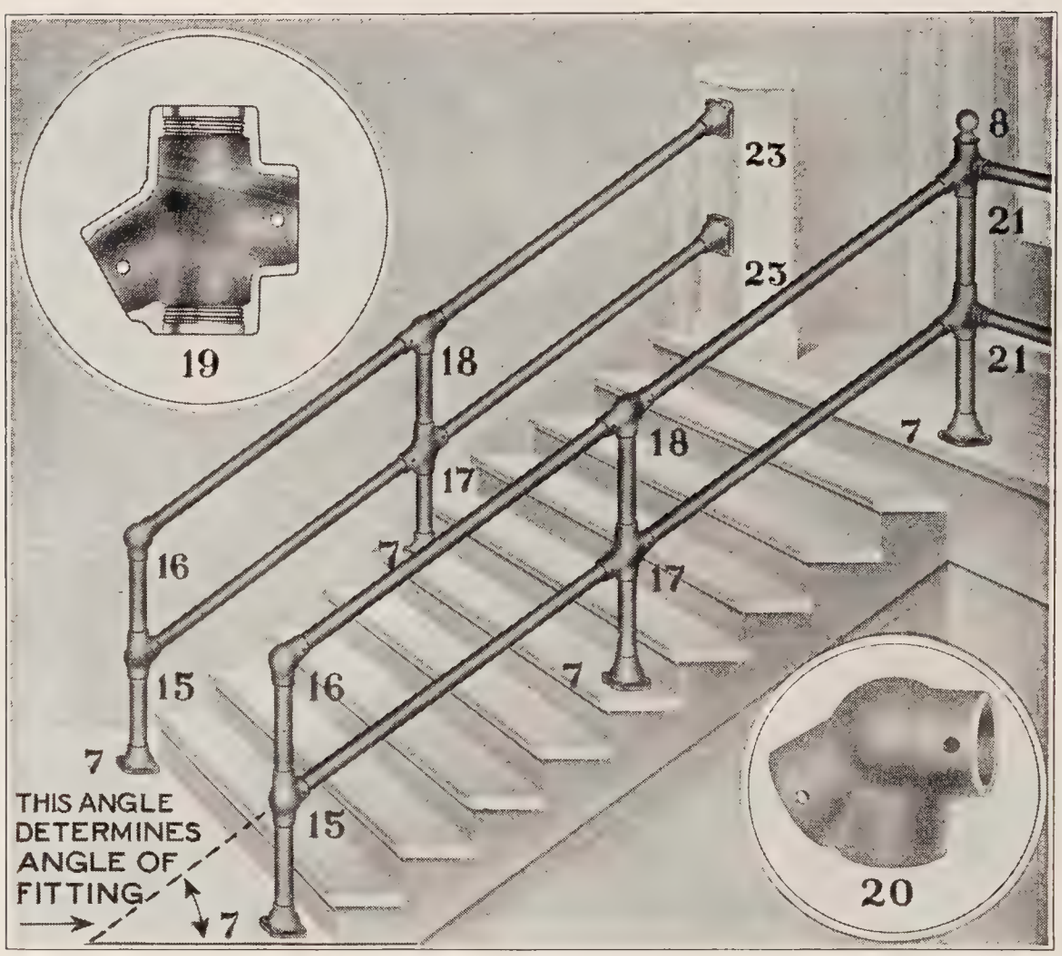
ADD 50 PER CENT FOR GALVANIZED WHERE GALV. PRICES ARE NOT GIVEN.

In ordering these Fittings, describe kind wanted by number and size.

SLIP AND SCREW JOINT VARIABLE ANGLE

MALLEABLE IRON STAIR RAIL FITTINGS

ANGLE FITTINGS, VERTICAL JOINTS SCREWED
ANGLE JOINTS DRILLED FOR RIVETS



CODE: FLABELLADO

These Fittings may be used on any Stair Rail between 27½° and 47½°.

30° Fittings—for angles between 27½° and 32½°.
35° Fittings—for angles between 32½° and 37½°.
40° Fittings—for angles between 37½° and 42½°.
45° Fittings—for angles between 42½° and 47½°.

When ordering, specify number and angle of fitting required.

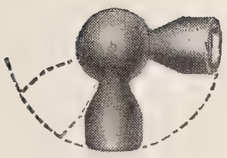
Size					
Size	Inches	1	1¼	1½	2
Size	Millimeters	25	32	38	50
No. 15, Angle Tee	Each	1.30	1.50	2.00	2.50
No. 16, Angle Elbow	Each	1.10	1.25	1.70	2.25
No. 17, Angle Cross	Each	1.50	1.75	2.35	2.75
No. 18, Angle Tee	Each	1.30	1.50	2.00	2.50
No. 19, Single Angle Cross	Each	1.50	1.75	2.35	2.75
No. 20, Single Angle Tee	Each	1.30	1.50	2.00	2.50
No. 21, Angle Tee, Right Hand, Side Outlet	Each	1.85	2.20	3.00	3.60
No. 22, Angle Tee, Left Hand, Side Outlet	Each	1.85	2.20	3.00	3.60
No. 23, Square Post Angle Flange	Each	1.50	1.75	1.90	2.25

These Fittings take the place of Special Angle Fittings, have a better appearance and are stronger than the adjustable, and are time and money savers.

The Posts are first screwed together and the rails are then fitted and riveted.

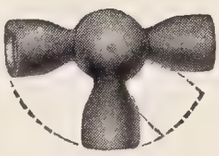
ADJUSTABLE RAILING FITTINGS

MALLEABLE IRON



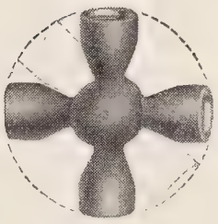
No. 70
CODE: FLAVESSIDO

No. 70½
CODE: FLEMAGOGO



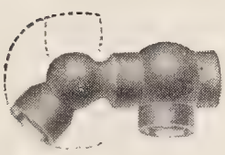
No. 71
CODE: FLEQUILLO

No. 72
CODE: FLEUGASTEN

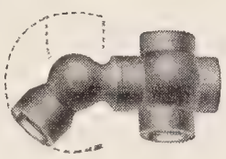


No. 73
CODE: FLEXATOTE

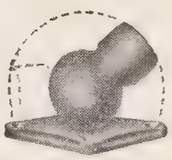
No. 74
CODE: FLIBUSTANO



No. 75
CODE: FLICTUROS



No. 76
CODE: FLOSCUPO



No. 79
CODE: FLOTENGLAS

Pipe Size.....Inches	1	1¼	1½	2
Pipe Size.....Millimeters	25	32	38	50
No. 70, Elbow.....Each	1.10	1.25	1.70	2.25
No. 70½, Elbow.....Each	.80	.90	1.20	1.65
No. 71, Tee.....Each	1.30	1.50	2.00	2.50
No. 72, Stair Tee.....Each	1.30	1.60	2.15	2.50
No. 73, Cross.....Each	1.50	1.75	2.35	2.75
No. 74, Stair Cross.....Each	1.50	1.85	2.50	2.75
No. 75, Stair Landing Tee.....Each	.90	1.10	1.50	2.15
No. 76, Stair Landing Cross.....Each	1.00	1.20	1.60	2.40
No. 79, Flange.....Each	1.65	1.75	1.90	2.50

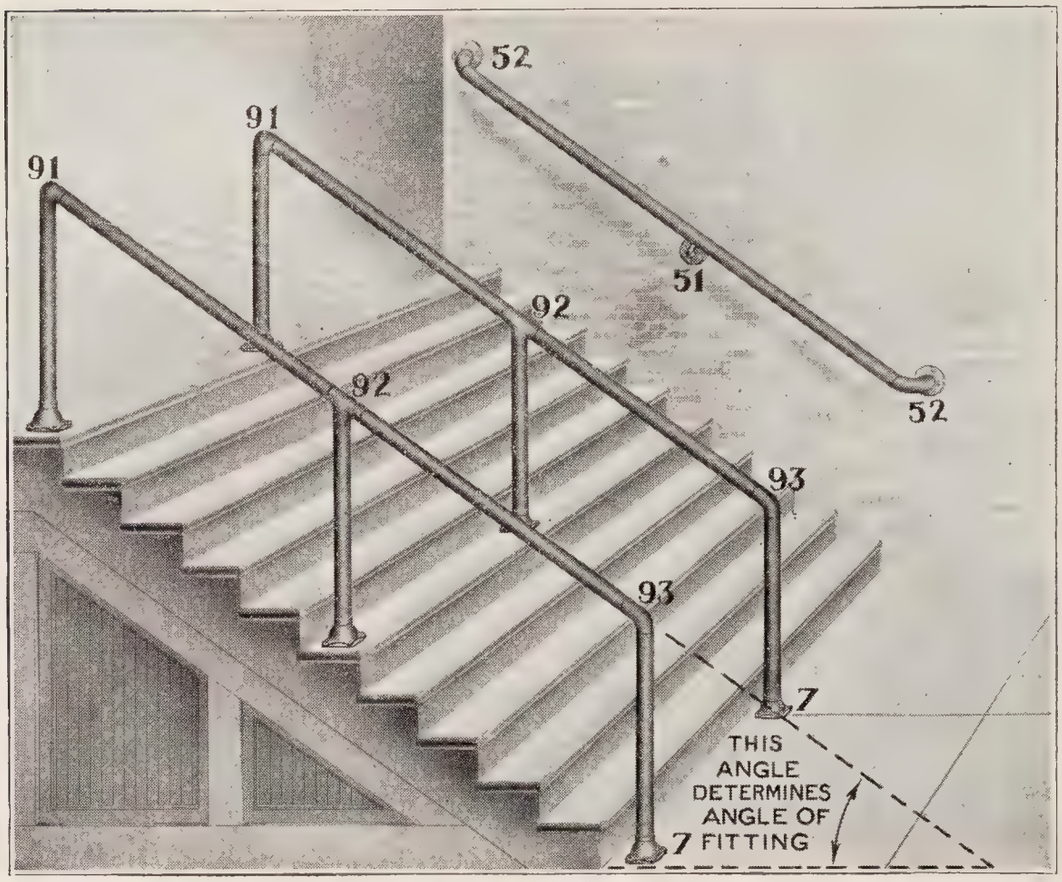
ADD 50 PER CENT TO ABOVE PRICES FOR GALVANIZED RAILING FITTINGS

Almost any Angle required for Stair Railings may be obtained with these Fittings.

All openings will be furnished tapped Right Hand. When ordered tapped otherwise, they will be charged 15 per cent additional net.

IN ORDERING, DESCRIBE KIND WANTED BY NUMBER AND SIZE

MALLEABLE IRON
FLUSH JOINT
STAIR RAIL FITTINGS
FOR SCHOOLS AND PUBLIC BUILDINGS



CODE: FLUCTIGENA

Size	Inches	1¼	1½	2
Size	Millimeters	32	38	50
No. 91, Stair Landing Elbow	Each	2.50	2.75	3.25
No. 91, Stair Landing Elbow, Galvanized	Each	2.80	3.15	3.75
No. 92, Center Rail Tee	Each	2.75	3.00	3.50
No. 92, Center Rail Tee, Galvanized	Each	3.15	3.50	4.15
No. 93, Angle Elbow	Each	2.50	2.75	3.25
No. 93, Angle Elbow, Galvanized	Each	2.80	3.15	3.75

Furnished in any angle between 27½° and 47½°.

THESE FITTINGS ARE MADE WITH AN EXTENSION OR CONNECTOR, OVER WHICH THE PIPE IS TIGHTLY DRIVEN UP TO THE FACE OF FITTINGS, FORMING A SMOOTH, FLUSH JOINT.

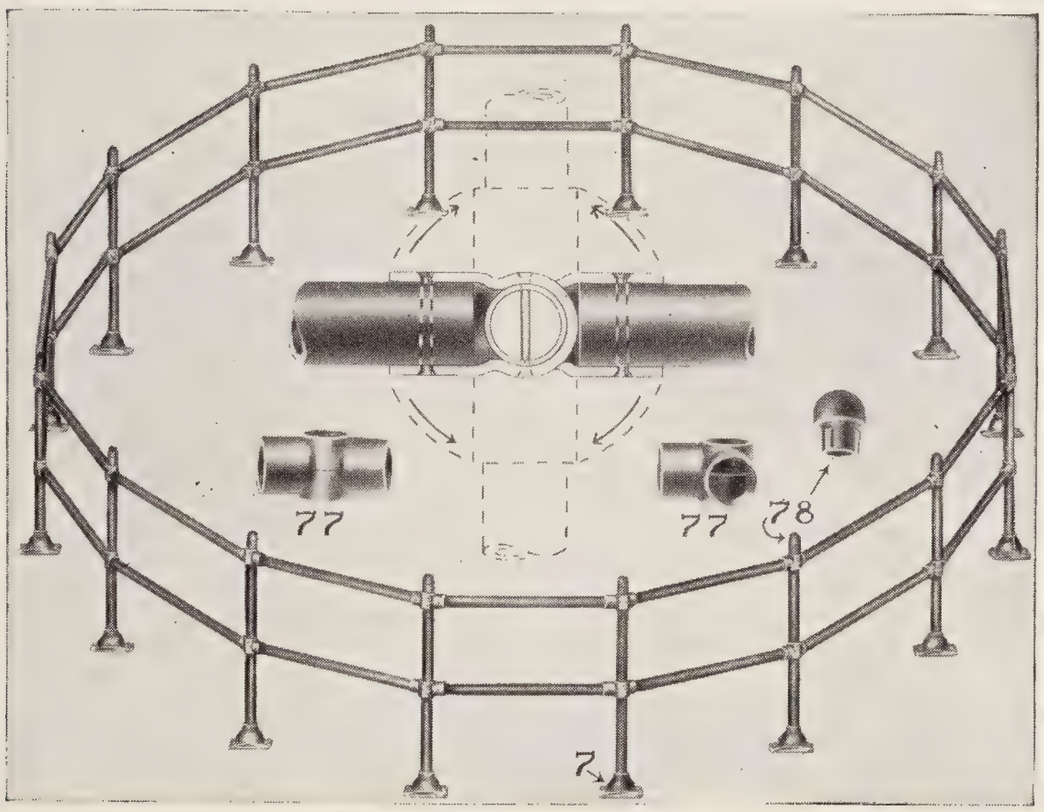
THESE FITTINGS WILL BE FURNISHED TO ORDER ONLY.

FITTINGS CAN BE FURNISHED OF BRASS AT A SPECIAL PRICE.

INQUIRIES AND ORDERS SHOULD SPECIFY STYLE NUMBER, SIZE AND ANGLE, ALSO WHETHER BLACK OR GALVANIZED.

ALL-SLIP
ADJUSTABLE RAILING CROSS

MALLEABLE IRON



NO. 77 ALL-SLIP ADJUSTABLE CROSS
CODE: FLUGSAME

NO. 78 MALLEABLE CAP
CODE: FLUIBUNDA

NO. 7 SQUARE FLOOR FLANGE, THREADED

Size.....Inches	1	1¼	1½	2
Size.....Millimeters	25	32	38	50
No. 77, All-Slip Cross.....Each	1.25	1.40	1.65	2.25
No. 77, All-Slip Cross, Galvanized.....Each	1.50	1.75	2.10	2.85
No. 78, All-Slip Cap.....Each	.40	.45	.50	.60
No. 78, All-Slip Cap, Galvanized.....Each	.50	.55	.65	.80

FOR PRICE OF NO. 7 SQUARE FLOOR FLANGE, SEE PAGE 342

This All-Slip Adjustable Cross is so constructed that it will take any angle between a straight line and 90 degrees. This gives an adjustable horizontal swing of 180 degrees, which will make possible a rail almost circular or elliptical in form depending upon the diameter or radius required and the number of posts used. It will thus be seen that its range of application will cover almost any horizontal angle from an approximate circle to a square.

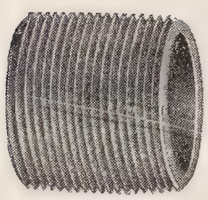
The Cross will not be furnished drilled for pins unless so specified, in which case an extra charge is made. Orders should state the size of pin holes.

The Malleable Cap is not threaded; it is constructed to be tightly driven into the pipe above the Cross.

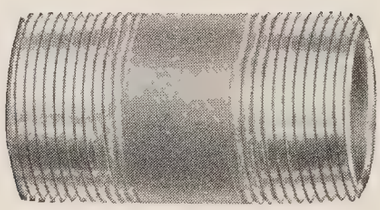
WROUGHT NIPPLES

BLACK—RIGHT HAND

CODE: FOGLIATURA



CLOSE



SHOULDER

TABLE OF SIZES AND LENGTHS KEPT IN STOCK

Size, Inches	Size Millimeters	Length, Inches						Prices		Price of Special Length Nipples — Length, Inches								
		*Close	*Short	Long				Close or Short	Long	1	1¼	1½	1¾	2¼	2¾	3¼	3¾	4¼
⅛	3	¾	1½	2	2½	3	3½	.04	.06	.04	.04		.06	.06	.06	.06		
¼	6	⅞	1½	2	2½	3	3½	.04	.06	.04	.04		.06	.06	.06	.06		
⅜	10	1	1½	2	2½	3	3½	.04	.06		.04		.06	.06	.06	.06		
½	13	1⅛	1½	2	2½	3	3½	.05	.07	.05	.05		.07	.07	.07	.07		
¾	19	1⅜	2	2½	3	3½	4	.06	.09	.06	.06		.06	.09	.09	.09	.09	
1	25	1½	2	2½	3	3½	4	.08	.13	.08	.08		.08	.13	.13	.13	.13	.
1¼	32	1⅝	2½	3	3½	4	4½	.11	.17		.11	.11	.11	.11	.17	.17	.17	.17
1½	38	1¾	2½	3	3½	4	4½	.13	.20			.13		.13	.20	.20	.20	.20
2	50	2	2½	3	3½	4	4½	.18	.27			.18	.18	.18	.27	.27	.27	.27
2½	64	2½	3	3½	4	4½	5	.39	.59									
3	76	2⅝	3	3½	4	4½	5	.48	.72									
3½	90	2¾	4	4½	5	5½	6	.75	1.05									
4	100	2⅞	4	4½	5	5½	6	.85	1.20									
4½	113	2⅞	4	4½	5	5½	6	1.25	1.70									
5	125	3	4½	5	5½	6	6½	1.55	2.45									
6	150	3⅛	4½	5	5½	6	6½	1.85	2.90									
7	175	3¼	5					3.20										
8	200	3½	5					3.55										
9	225	3⅝	5					5.25										
10	250	3⅞	5					6.75										
12	300	4½	6					8.00										

*These lengths conform to the Manufacturers' Standard. Nipples made to order from extra strong pipe at double the above list.

EXTRA LONG WROUGHT NIPPLES

BLACK **RIGHT HAND**

CODE: FORNACATOR

TABLE OF SIZES AND LENGTHS KEPT IN STOCK

PRICE OF EXTRA LONG NIPPLES

Size Inches	Size Millimeters	Length—Inches										
		3¾	4	4¼	4½	4¾	5	5¼	5½	5¾	6	6½
⅛	3	.07	.07	.08	.08	.08	.08	.10	.10	.....	.10	.12
¼	6	.07	.07	.08	.08	.08	.08	.10	.10	.10	.10	.12
⅜	10	.07	.07	.08	.08	.08	.08	.10	.10	.10	.10	.12
½	13	.08	.08	.10	.10	.10	.10	.12	.12	.12	.12	.14
¾	19	....	....	.11	.11	.11	.11	.13	.13	.13	.13	.17
1	25	....	....	.15	.15	.15	.15	.18	.18	.18	.18	.23
1¼	32	....	....	.....	....	.20	.20	.24	.24	.24	.24	.29
1½	38	....	....	.....	....	.25	.25	.29	.29	.29	.29	.36
2	50	....	....	.....	....	.32	.32	.38	.38	.....	.38	.50
2½	64	....	....	.....	....	.....	....	.....	.68	.....	.68	.90
3	76	....	....	.....	....	.....	....	.....	.85	.....	.85	1.08
3½	90	....	....	.....	....	.....	....	.....	....	.....	....	1.30
4	100	....	....	.....	....	.....	....	.....	....	.....	....	1.52
4½	113	....	....	.....	....	.....	....	.....	....	.....	....	2.25
5	125	....	....	.....	....	.....	....	.....	....	.....	....	.....
6	150	....	....	.....	....	.....	....	.....	....	.....	....	.....
7	175	....	....	.....	....	.....	....	.....	....	.....	3.60	.....
8	200	....	....	.....	....	.....	....	.....	....	.....	4.05	.....
9	225	....	....	.....	....	.....	....	.....	....	.....	....	.....
10	250	....	....	.....	....	.....	....	.....	....	.....	....	.....
12	300	....	....	.....	....	.....	....	.....	....	.....	....	.....

Size Inches	Size Millimeters	Length—Inches										
		7	7½	8	8½	9	9½	10	10½	11	11½	12
⅛	3	.12	.14	.14	.15	.15	....	.17	.18	.18	.19	.19
¼	6	.12	.14	.14	.15	.15	.17	.17	.18	.18	.19	.19
⅜	10	.12	.14	.14	.15	.15	.17	.17	.18	.18	.19	.19
½	13	.14	.16	.16	.18	.18	.20	.20	.22	.22	.23	.23
¾	19	.17	.18	.18	.20	.20	.22	.22	.24	.24	.26	.26
1	25	.23	.25	.25	.28	.28	.31	.31	.34	.34	.36	.36
1¼	32	.29	.33	.33	.36	.36	.40	.40	.44	.44	.47	.47
1½	38	.36	.40	.40	.45	.45	.50	.50	.54	.54	.59	.59
2	50	.50	.54	.54	.59	.59	.65	.65	.72	.72	.77	.77
2½	64	.90	.97	.97	1.06	1.06	1.17	1.17	1.26	1.26	1.35	1.35
3	76	1.08	1.20	1.20	1.33	1.33	1.45	1.45	1.58	1.58	1.70	1.70
3½	90	1.30	1.45	1.45	1.60	1.60	1.75	1.75	1.90	1.90	2.05	2.05
4	100	1.52	1.69	1.69	1.87	1.87	2.05	2.05	2.22	2.22	2.40	2.40
4½	113	2.25	2.50	2.50	2.75	2.75	2.95	2.95	3.17	3.17	....	3.40
5	125	2.58	2.83	2.83	3.10	3.10	3.35	3.35	3.60	3.60	3.85	3.85
6	150	3.05	3.35	3.35	3.70	3.70	4.00	4.00	....	4.30	4.65	4.65
7	175	4.05	....	4.45	....	4.90	....	5.30	....	5.75	....	6.15
8	200	4.55	....	5.05	....	5.50	....	6.00	....	6.50	....	7.00
9	225	....	....	6.50	....	7.10	....	7.75	....	8.40	....	9.00
10	250	....	....	8.25	....	8.90	....	9.70	....	10.40	....	11.15
12	300	....	....	10.00	....	10.80	....	11.75	....	12.70	....	13.65

Nipples made to order from Extra Strong Pipe at double the above list.

Nipples longer than 12-inch, made to order and charged as Cut Pipe with Threads extra.

WROUGHT NIPPLES

BLACK

RIGHT AND LEFT

CODE: FRAQUEAVA

TABLE OF SIZES AND LENGTHS

Size, Inches	Size Millimeters	Length, Inches						Prices		Prices of Extra Long Nipples								
		*Close	*Short	Long				Close or Short	Long	Inches								
										4	5	6	7	8	9	10	11	12
1/8	3	3/4	1 1/2	2	2 1/2	3	3 1/2	.05	.08	.09	.11	.13	.16	.18	.20	.23	.25	.27
1/4	6	7/8	1 1/2	2	2 1/2	3	3 1/2	.05	.08	.09	.11	.13	.16	.18	.20	.23	.25	.27
3/8	10	1	1 1/2	2	2 1/2	3	3 1/2	.05	.08	.09	.11	.13	.16	.18	.20	.23	.25	.27
1/2	13	1 1/8	1 1/2	2	2 1/2	3	3 1/2	.07	.10	.11	.13	.16	.18	.21	.24	.27	.29	.31
3/4	19	1 3/8	2	2 1/2	3	3 1/2	4	.08	.12		.15	.17	.23	.25	.27	.29	.32	.35
1	25	1 1/2	2	2 1/2	3	3 1/2	4	.11	.18		.20	.24	.31	.33	.37	.41	.45	.48
1 1/4	32	1 5/8	2 1/2	3	3 1/2	4	4 1/2	.15	.23		.27	.32	.39	.45	.50	.55	.60	.65
1 1/2	38	1 3/4	2 1/2	3	3 1/2	4	4 1/2	.18	.27		.34	.39	.48	.52	.60	.67	.72	.80
2	50	2	2 1/2	3	3 1/2	4	4 1/2	.24	.36		.43	.51	.67	.72	.80	.87	.96	1.03
2 1/2	64	2 1/2	3	3 1/2	4	4 1/2	5	.52	.79			.91	1.20	1.30	1.40	1.55	1.68	1.80
3	76	2 5/8	3	3 1/2	4	4 1/2	5	.65	.96			1.13	1.44	1.60	1.77	1.93	2.10	2.27
3 1/2	90	2 3/4	4	4 1/2	5	5 1/2	6	1.00	1.40				1.75	1.95	2.15	2.35	2.55	2.75
4	100	2 7/8	4	4 1/2	5	5 1/2	6	1.15	1.60				2.00	2.25	2.50	2.75	3.00	3.25

*These lengths conform to the Manufacture standard.

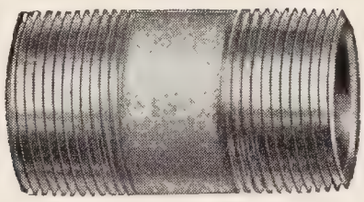
Add 60 per cent to above prices for Galvanized Right and Left Nipples.

WROUGHT NIPPLES

GALVANIZED—RIGHT HAND

CODE: FUNDANIANO

CLOSE



SHOULDER

TABLE OF SIZES AND LENGTHS KEPT IN STOCK

Size	Size	Length, Inches					Price		Price of Special Length Inches							
Inches	Millimeters	*Close	*Short	Long			Close or Short	Long	1	1¼	1½	1¾	2¼	2¾	3¼	3¾
⅛	3	¾	1½	2	2½	3	3½	.06	.11	.06	.06						
¼	6	⅞	1½	2	2½	3	3½	.06	.11	.06	.06		.11	.11			
⅜	10	1	1½	2	2½	3	3½	.06	.11		.06				.11	.11	
½	13	1⅛	1½	2	2½	3	3½	.06	.11	.06	.06		.11	.11	.11	.11	
¾	19	1⅜	2	2½	3	3½	4	.08	.14	.08	.08		.08	.14	.14	.14	.14
1	25	1½	2	2½	3	3½	4	.11	.19		.11		.11	.19	.19		.19
1¼	32	1⅝	2½	3	3½	4	4½	.17	.29		.17	.17			.29	.29	.29
1½	38	1¾	2½	3	3½	4	4½	.21	.35			.21		.21		.35	
2	50	2	2½	3	3½	4	4½	.27	.47			.27	.27		.47	.47	
2½	64	2½	3	3½	4	4½	5	.56	.86								
3	76	2⅝	3	3½	4	4½	5	.70	1.10								
3½	90	2¾	4	4½	5	5½	6	1.20	1.70								
4	100	2⅞	4	4½	5	5½	6	1.35	1.87								
4½	113	2⅞	4	4½	5	5½	6	1.85	2.60								
5	125	3	4½	5	5½	6	6½	2.30	3.15								
6	150	3⅛	4½	5	5½	6	6½	2.80	4.25								
7	175	3¼	5					4.25									
8	200	3½	5					5.00									

*These lengths conform to the Manufacturer's Standard.

EXTRA LONG WROUGHT NIPPLES

GALVANIZED—RIGHT HAND

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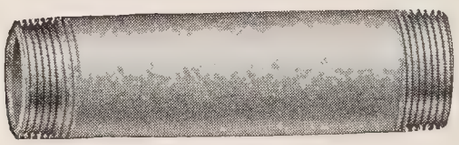


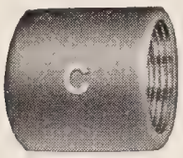
EXTRA LONG

TABLE OF SIZES AND LENGTHS KEPT IN STOCK

Size Inches	Size Millimeters	Prices of Extra Long Nipples Length, Inches										
		3¾	4	4¼	4½	4¾	5	5¼	5½	5¾	6	6½
⅛	3	.12	.12		.15		.15		.17		.17	
¼	6		.12	.15	.15		.15		.17		.17	
⅜	10		.12		.15		.15		.17		.17	.21
½	13	.13	.13	.16	.16	.16	.16	.18	.18	.18	.18	.23
¾	19			.18	.18	.18	.18	.21	.21	.21	.21	.26
1	25				.24		.24	.28	.28		.28	.34
1¼	32						.32	.38	.38		.38	.45
1½	38						.39		.46		.46	.55
2	50						.52		.61		.61	.74
2½	64								1.00		1.00	1.26
3	76								1.30		1.30	1.60
3½	90											
4	100											2.30
4½	113											
5	125											
6	150											
7	175										4.95	
8	200										5.80	

Size Inches	Size Millimeters	Prices of Extra Long Nipples Length, Inches										
		7	7½	8	8½	9	9½	10	10½	11	11½	12
⅛	3	.21		.24		.26		.29		.31		.34
¼	6	.21	.24	.24		.26		.29		.31		.34
⅜	10	.21	.24	.24	.26	.26		.29	.31	.31	.34	.34
½	13	.23	.26	.26	.28	.28	.31	.31	.33	.33	.36	.36
¾	19	.26	.29	.29	.32	.32	.35	.35	.38	.38	.41	.41
1	25	.34	.38	.38	.42	.42	.47	.47		.51		.55
1¼	32	.45	.51	.51		.57	.63	.63	.69	.69		.75
1½	38	.55	.63	.63	.70	.70		.77	.84	.84	.91	.91
2	50	.74	.83	.83	.93	.93		1.03	1.13	1.13	1.23	1.23
2½	64	1.26		1.41		1.56		1.71	1.86	1.86		2.01
3	76	1.60	1.80	1.80	2.00	2.00		2.20		2.40		2.60
3½	90	2.10		2.35		2.60		2.85		3.15		3.40
4	100	2.30	2.60	2.60	2.90	2.90	3.20	3.20	3.50	3.50	3.80	3.80
4½	113	3.30		3.65		4.05		4.45		4.85		5.25
5	125	3.75		4.20		4.60		5.00		5.40		5.85
6	150	4.50		5.00		5.55		6.05		6.60		7.15
7	175	5.65		6.35		7.05		7.75		8.45		9.20
8	200	6.65		7.50		8.35		9.25		10.10		10.95

WROUGHT COUPLINGS



STANDARD

CODE: GANSINHOS

CAR HEATER

CODE: GARGETTUS

STANDARD

Size of Pipe Inches	Size of Pipe Milli-meters	Price Black Each	Price Galv. Each	Price Right and Left Black Each	Nominal Outside Diameter Inches	Length of Coupling Inches	Average Weight of Coupling Pounds	No. of Threads Per Inch of Screw
1/8	3	.05	.06		19/32	15/16	.03	27
1/4	6	.05	.06	.07	3/4	1 1/32	.07	18
3/8	10	.06	.08	.08	29/32	1 5/32	.11	18
1/2	13	.07	.10	.11	1 1/16	1 5/16	.15	14
3/4	19	.10	.13	.15	1 11/32	1 9/16	.25	14
1	25	.13	.18	.20	1 5/8	1 13/16	.42	11 1/2
1 1/4	32	.17	.25	.25	1 31/32	2 1/16	.60	11 1/2
1 1/2	38	.21	.32	.30	2 15/16	2 5/16	.81	11 1/2
2	50	.28	.40	.50	2 23/32	2 9/16	1.18	11 1/2
2 1/2	64	.40	.55	.85	3 5/16	2 7/8	1.70	8
3	76	.60	.80	1.20	3 15/16	3 1/16	2.45	8
3 1/2	90	.80	1.05	1.60	4 7/16	3 7/16	3.40	8
4	100	1.00	1.40	2.00	4 15/16	3 7/16	3.50	8
4 1/2	113	1.50	2.00		5 17/32	3 5/8	4.70	8
5	125	1.65	2.25		6 1/4	4 1/8	8.50	8
6	150	2.40	3.25		7 9/32	4 1/8	9.70	8
7	175	3.25			8 9/32	4 1/8	11.10	8
8	200	4.25			9 1/4	4 5/8	13.60	8
9	225	5.50			10 5/16	5 1/8	17.40	8
10	250	7.50			11 5/8	6 1/8	31.10	8
12	300	10.00			13 7/8	6 1/8	44.20	8

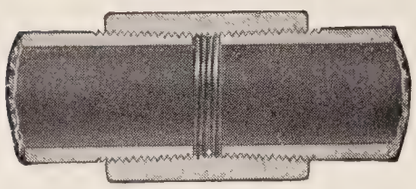
1 1/4-inch turned and faced Couplings to fit inside of 2-inch wrought pipe. Price on application.

CAR HEATER

Size Inches	Size Millimeters	Actual Outside Diameter Inches	Length of Couplings Inches	PRICE R. H. Black Each	R. and L. Black Each	R. H. Galvanized Each	R. and L. Galvanized Each
1/2	13	1 1/8	1 7/8	.14	.20	.20	.25
3/4	19	1 7/16	2 1/8	.20	.30	.25	.35
1	25	1 5/8	2 3/8	.26	.40	.32	.45
*1 1/4	32	2 1/8	2 1/8	.34	.45	.42	.55
1 1/2	38	2 5/16	2 7/8	.42	.55	.55	.70
2	50	2 13/16	3 1/8	.56	.70	.75	.90

*Special Short Pattern.

EXTRA HEAVY OR HYDRAULIC COUPLINGS



HYDRAULIC COUPLINGS
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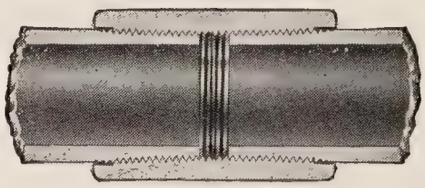


RECESSED HYDRAULIC COUPLINGS
CODE: GAUCHLAUCH

Size of Pipe Inches	Size of Pipe Milli-meters	Price Black Each	Price Galv. Each	Price Re-cessed Black Each	Price Re-cessed Galv. Each	Price R. & L. Black. Each	Price R. & L. Galv. Each	Nominal Out-side Diam. Inches	Length Inches	Average Weight Pounds	No. of Threads per inch of Screw
3/8	10	.14	.20	.25	.30			.95	1 1/2	.23	18
1/2	13	.14	.20	.25	.30	.20	.25	1.13	1 7/8	.28	14
3/4	19	.20	.25	.30	.35	.30	.35	1.44	2 1/8	.50	14
1	25	.26	.32	.35	.40	.40	.45	1.63	2 3/8	.56	11 1/2
1 1/4	32	.34	.42	.45	.55	.45	.55	2.07	2 5/8	.90	11 1/2
1 1/2	38	.42	.55	.55	.70	.55	.70	2.31	2 7/8	1.35	11 1/2
2	50	.56	.75	.70	.90	.70	.90	2.81	3 1/8	1.80	11 1/2
2 1/2	64	.80	1.05	.95	1.20			3.31	3 1/2	2.40	8
3	76	1.20	1.50	1.40	1.70			4.00	3 11/16	3.46	8
3 1/2	90	1.60	1.90	1.85	2.15			4.63	4 1/4	5.25	8
4	100	2.00	3.00	2.25	3.25			5.13	4 1/4	6.80	8

These Couplings are made extra heavy and long, and cut with a perfect taper and longer thread.

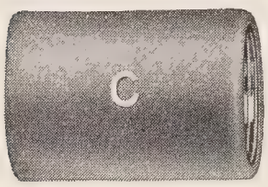
Threads for these Couplings may be cut with an ordinary die.

The object of the Recessed Couplings is to make a better joint, protecting the pipe at the weak point, viz.: That part left exposed from cutting the thread and not covered with the ordinary coupling.

XX HYDRAULIC COUPLINGS

CODE: GEBADETEN

Size.....Inches	3/4	1	1 1/4	1 1/2	2	2 1/2
Size.....Millimeters	.19	.25	.32	.38	.50	.64
Price, Black.....Each	.40	.55	.70	.85	1.15	1.60
Price, Recessed, Black.....Each	.50	.65	.85	1.00	1.30	1.85
Outside Diameter.....Inches	1.66	1.90	2.22	2.44	3.19	3.62
Length.....Inches	1 7/8	2 5/8	2 7/8	3 1/8	3 3/8	3 5/8
Threads to Inch of Screw.....	14	11 1/2	11 1/2	11 1/2	11 1/2	8
Weight, Each.....Pounds	.70	1.12	1.50	1.88	3.55	4.50



STANDARD CASING COUPLINGS

CODE: GEBAUSCHET

Size.....Inches	2	2¼	2½	2¾	3	3¼	3½	3¾	4	4¼
Black.....Each	.16	.20	.25	.30	.35	.40	.46	.52	.60	.68
Galvanized...Each	.23	.28	.35	.42	.50	.57	.65	.73	.85	1.00
R.& L.,Black Each	1.70	1.80	2.00	2.10	2.50	2.60	3.00	3.10	3.70	3.95
Size.....Inches	4½	4¾	5	5 3/16	5⅝	6¼	6⅝	7¼	7⅝	8¼
Black.....Each	.74	.80	.90	1.00	1.20	1.35	1.50	1.65	1.75	2.25
Galvanized...Each	1.05	1.15	1.30	1.40	1.70	1.90	2.15	2.35	2.50	3.25
R.& L.,Black Each	4.55	4.85	5.25	5.50	6.10	6.45	7.10	7.55	8.30	9.30
Size.....Inches	8⅝	9⅝	10⅝	11⅝	12½	13½	14½	15½		
Black.....Each	2.85	3.50	4.50	5.15	6.75	7.60	8.75	10.00		
Galvanized...Each	3.75	5.00	6.15	6.95	8.85	10.15	11.75	13.15		
R.& L.,Black Each	10.25	11.80	13.25	14.25	16.80	18.65	21.00	22.25		

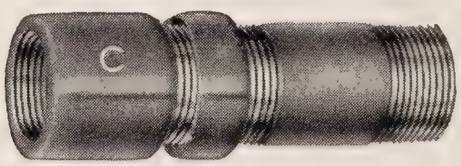
COUPLINGS FOR LARGE O. D. PIPE

CODE: GEGERBTEN

O. D. Pipe Size.....Inches	14	15	16	17	18	20
Recessed Couplings.....Each	10.00	13.00	20.00	28.00	33.00	48.00

LONG SCREWS

WITH COUPLING AND LOCK NUT FACED



CODE: GEHAPERD

Size.....Inches	¼	⅜	½	¾	1	1¼	1½	2	2½	3	3½	4
Size.....Millimeters	6	10	13	19	25	32	38	50	64	76	90	100
Standard Length..Inches	2½	3	3½	4	4½	5	5½	6	7	8	8½	9
Price.....Each	.30	.35	.40	.55	.75	1.00	1.30	1.70	2.70	3.70	5.40	6.60
Price, Galv.....Each	.35	.40	.50	.66	1.00	1.25	1.60	2.10	3.10	4.70	6.50	7.75

Long Screws, longer than Standard, made to order and charged as CUT PIPE, with Threads, Couplings and Lock Nuts, extra.

In ordering, always specify the length of thread wanted.

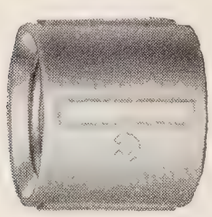
Extra Heavy long Screws made to order from Extra Strong pipe.

FACED LOCK NUTS

MALLEABLE IRON

CODE: GEKANTETER

Size.....Inches	¼	⅜	½	¾	1	1¼	1½	2	2½	3
Size.....Millimeters	6	10	13	19	25	32	38	50	64	76
Price.....Each	.08	.09	.10	.12	.15	.20	.25	.30	.35	.45
Price, Galv.....Each	.11	.13	.15	.18	.22	.30	.35	.45	.50	.65



FACED COUPLINGS

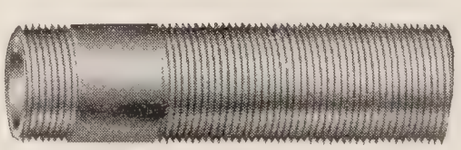
CODE: GEKLARTER

Size.....Inches	¼	⅜	½	¾	1	1¼	1½	2	2½	3	3½	4	4½	5	6
Size...Millimeters	6	10	13	19	25	32	38	50	64	76	90	100	113	125	150
Price.....Each	.09	.10	.12	.16	.22	.30	.40	.50	.70	.90	1.20	1.50	2 10	2.40	3.60
Price, Galv..Each	.14	.15	.18	.24	.33	.45	.60	.75	1.00	1.35	1.80	2.25			

Sizes 3-inch and smaller are malleable iron.

Sizes 3½ to 6-inch are wrought.

TANK NIPPLES



6 INCHES LONG OVER ALL

CODE: GELBKEHLE

Size.....Inches	¼	⅜	½	¾	1	1¼	1½	2	2½	3
Size.....Millimeters	6	10	13	19	25	32	38	50	64	76
Price.....Each	.10	.10	.12	.13	.18	.24	.29	.38	.68	.85
Price, Galv.....Each	.17	.17	.18	.21	.28	.38	.46	.61	1.00	1.30

These Nipples have an American Standard Lock-Nut Thread 4 inches long on one end; the other end has a Standard Pipe Thread.

RETURN BENDS

MADE FROM EXTRA STRONG WROUGHT PIPE

CODE: GELOFTUIT

Size.....Inches	½	¾	1	1¼	1½	2
Size.....Millimeters	13	19	25	32	38	50
Distance C. to C. of Pipe.....Inches	4⅛	4½	4½	6	8	8
Length, Center to End.....Inches	3½	3¾	5	6	8	8
Price.....Each	.90	1.10	1.25	1.75	2.75	4.00

QUARTER BENDS

MADE FROM EXTRA STRONG WROUGHT PIPE

CODE: GELOUTERD

Size.....Inches	½	¾	1	1¼	1½	2
Size.....Millimeters	13	19	25	32	38	50
Radius.....Inches	2 1/16	2¼	2½	4¾	6¾	6¾
Length, Center to End.....Inches	3½	3¾	4¼	6½	8½	9½
Price.....Each	.45	.55	.75	1.25	2.00	3.25

GOOSE NECKS

MADE FROM EXTRA STRONG WROUGHT PIPE

CODE: GELUKKIGER

Size.....Inches	¾	1	1¼
Size.....Millimeters	19	25	32
Least Distance between Centers Pipe can be bent...Inches	4	4½	6
Least Length Center to End Goose necks can be made Ins.	3¾	4¼	6

Prices on application.

We will quote prices on Bends differing from above, upon receipt of dimensions and number required.

STANDARD CAST IRON

FLAT BAND SCREWED FITTINGS

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS
FOR WATER WORKING PRESSURES UP TO 175 POUNDS

MERITS OF STANDARD SCREWED FITTINGS

General satisfaction is expressed by all of our customers in the design, utility, strength and general appearance of our Standard Screwed Fittings.

In general design our Reducing Fittings are in direct proportion with the straight sizes, thus harmonizing the fittings in any combination of piping.

All fittings are chamfered, permitting an easy entrance of the pipe, and are uniformly threaded to the American Standard for Pipe Threads.

These fittings are well proportioned, of good weight and suitable for the steam working pressures for which they are recommended.

We have, at various times, taken these fittings at random out of stock and subjected them to hydraulic pressures of 1,000 to 2,500 pounds, according to size, before breaking them. It is evident from these tests that we are supplying fittings with a very large factor of safety. But we do not recommend them for more than 125 pounds steam working pressure. It is not only a question of the fittings standing a higher pressure, but also the strain of expansion, contraction, weight of piping, settling and water hammer; there is also a possibility that they will not run uniform.

When fittings are wanted for a higher steam working pressure than 125 pounds, we recommend our Extra Heavy Fittings.

LARGELY INCREASED VARIETY OF SIZES

We believe that the largely increased variety of straight and reducing sizes tabulated on pages 688 to 695 will be found sufficient to fully meet the requirements of the trade.

To avoid making fittings to order we recommend the use of bushings.

Where it is necessary to have special fittings made, without the use of bushings, we will, upon receipt of specifications, name prices, which, unless quantities are large, will show that the manufacturing of special fittings is costly.

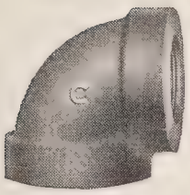
GALVANIZED FITTINGS

Such fittings as are listed on pages 688 to 695, and marked with an * are carried in stock galvanized. Other sizes will be galvanized to order only.

TESTED FITTINGS

Fittings tested to 200 pounds air pressure or 250 pounds water pressure will be made to order. Prices according to quantity wanted. Always state whether these fittings are to be used for steam, water, gas or air.

FOR GENERAL DIMENSIONS SEE PAGE 643



STEAM AND GAS FITTINGS

ELBOWS

CAST IRON

STRAIGHT

CODE: GELUNGENER Right and Left Hand Elbows have Ribs on Left Hand End.

Size.....Inches	¼	⅜	½	¾	1	1¼	1½	2	2½	3
Size.....Millimeters	6	10	13	19	25	32	38	50	64	76
Price, R. H.....Each	.05	.05	.06	.08	.10½	.16	.20	.28	.50	.75
Price, R. and L..Each	.06	.06	.07	.09	.12	.18	.23	.32	.60	.85
Price, R.H.,Galv.Each	.10	.10	.12	.16	.21	.32	.40	.56	1.00	1.50
Price, Pitched....Each			.08	.10	.13	.20	.25	.35	.65	1.00

Size.....Inches	3½	4	4½	5	6	7	8	9	10	12
Size.....Millimeters	90	100	113	125	150	175	200	225	250	300
Price, R. H.....Each	1.05	1.20	1.75	2.00	2.75	4.70	6.75	9.00	13.50	20.00
Price, R.H.,Galv.Each	2.10	2.40	3.50	4.00	5.50	9.40	13.50	18.00	27.00	40.00
Price, Pitched....Each	1.30	1.50								

Pitched Elbows are tapped, pitched ¼-inch to the foot.

REDUCING ELBOWS

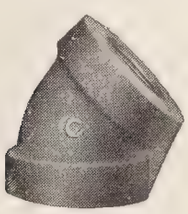
CAST IRON

CODE: GEMINAVATE

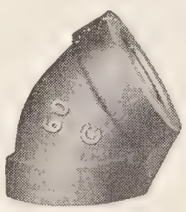
Size.....Inches	⅜	½	¾	1	1¼	1½	2	2½	3	3½
Size.....Millimeters	10	13	19	25	32	38	50	64	76	90
Price.....Each	.06	.07	.09	.12	.18	.23	.32	.60	.85	1.20
Price, Galv.....Each		.14	.18	.24	.36	.46	.64	1.20	1.70	2.40
Price, Pitched....Each			.10	.13	.20	.25	.35	.65	1.00	1.30

Size.....Inches	4	4½	5	6	7	8	9	10	12	
Size.....Millimeters	100	113	125	150	175	200	225	250	300	
Price.....Each	1.40	2.00	2.30	3.15	5.40	7.75	10.50	15.50	23.00	
Price, Galv.....Each	2.80	4.00	4.60	6.30	10.80	15.50	21.00	31.00	46.00	

Pitched Elbows are tapped, pitched ¼-inch to the foot.
See page 688 for sizes of Reducing Elbows carried in stock.



45° ELBOWS
CODE: GENNESARET



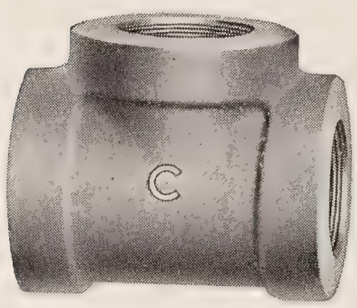
60° ELBOWS
CODE: GENUFLESSO

22½° ELBOWS
CODE: GENUSREGEL

Size.....Inches	¼	⅜	½	¾	1	1¼	1½	2	2½	3
Size.....Millimeters	6	10	13	19	25	32	38	50	64	76
Price, 45°.....Each	.06	.06	.07	.10	.12	.19	.24	.34	.60	.90
Price, 45°, Galv...Each	.12	.12	.14	.20	.24	.38	.48	.68	1.20	1.80
Price, 60° or 22½°.Each			.25	.30	.35	.45	.50	.60	1.10	1.65

Size.....Inches	3½	4	4½	5	6	7	8	9	10	12
Size.....Millimeters	90	100	113	125	150	175	200	225	250	300
Price, 45°.....Each	1.25	1.45	2.20	2.50	3.45	5.90	8.50	11.25	17.00	25.00
Price, 45°, Galv...Each	2.50	2.90	4.40	5.00	6.90	11.80	17.00	22.50	34.00	50.00
Price, 60° or 22½°.Each		2.75		5.00	7.00					

We can make to order, 30° or any other special degree fittings, at a special price, according to sizes and quantities wanted.



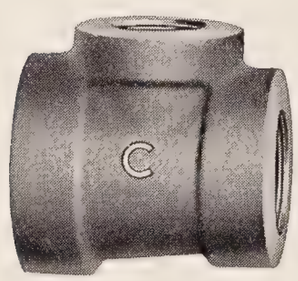
TEES

CAST IRON

STRAIGHT

CODE: GEPORTELD

Size.....Inches	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3
Size.....Millimeters	6	10	13	19	25	32	38	50	64	76
Price.....Each	.08	.08	.09	.12	.15	.23	.29	.41	.73	1.10
Price, Galv.....Each	.16	.16	.18	.24	.30	.46	.58	.82	1.46	2.20
Size.....Inches	3 1/2	4	4 1/2	5	6	7	8	9	10	12
Size.....Millimeters	90	100	113	125	150	175	200	225	250	300
Price.....Each	1.50	1.75	2.55	3.00	4.00	6.80	9.75	13.00	19.50	29.00
Price, Galv.....Each	3.00	3.50	5.10	6.00	8.00	13.60	19.50	26.00	39.00	58.00



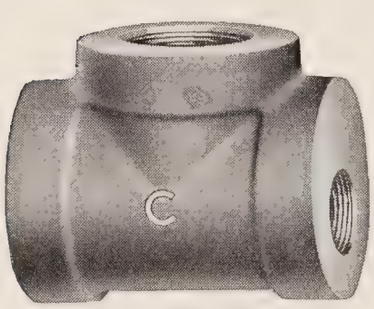
REDUCING TEES

CAST IRON

CODE: GERARQUIA

Size.....Inches	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2
Size.....Millimeters	10	13	19	25	32	38	50	64	76	90
Price.....Each	.09	.10	.14	.17	.27	.33	.47	.83	1.25	1.75
Price, Galv.....Each	.18	.20	.28	.34	.54	.66	.94	1.66	2.50	3.50
Size.....Inches	4	4 1/2	5	6	7	8	9	10	12	
Size.....Millimeters	100	113	125	150	175	200	225	250	300	
Price.....Each	2.00	2.95	3.50	4.60	7.80	11.25	15.00	22.50	33.50	
Price, Galv.....Each	4.00	5.90	7.00	9.20	15.60	22.50	30.00	45.00	67.00	

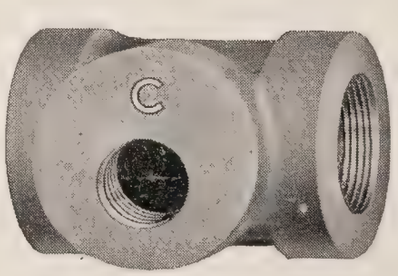
See pages 688 to 691 for sizes of Reducing Tees carried in stock.



ECCENTRIC TEES

CAST IRON

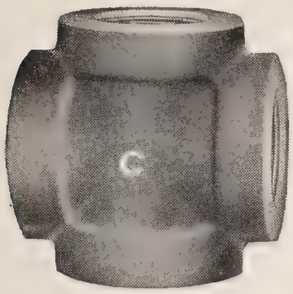
CODE: GINNOSTILO



The object of these fittings is to prevent lodging places for water, which always is the case where double reducing fittings are used.

Inquiries and orders for Eccentric Tees should be accompanied by a sketch showing the exact position in which the fitting is to be placed and the eccentric openings.

PRICES ON APPLICATION



CROSSES

CAST IRON

STRAIGHT

CODE: GIPSABGUSS

Size.....Inches	½	¾	1	1¼	1½	2	2½	3	3½
Size.....Millimeters	13	19	25	32	38	50	64	76	90
Price.....Each	.16	.22	.27	.42	.53	.75	1.30	2.00	2.70
Price, Galvanized...Each	.32	.44	.54	.84	1.06	1.50	2.60	4.00	5.40

Size.....Inches	4	4½	5	6	7	8	9	10	12
Size.....Millimeters	100	113	125	150	175	200	225	250	300
Price.....Each	3.15	4.60	5.50	7.25	12.25	17.50	23.50	35.00	52.50
Price, Galvanized...Each	6.30	9.20	11.00	14.50	24.50	35.00	47.00	70.00	105.00

REDUCING CROSSES

CAST IRON

CODE: GIRALVAS

Size.....Inches	½	¾	1	1¼	1½	2	2½	3	3½
Size.....Millimeters	13	19	25	32	38	50	64	76	90
Price.....Each	.18	.25	.30	.46	.60	.83	1.45	2.20	3.00
Price, Galvanized...Each	.36	.50	.60	.92	1.20	1.66	2.90	4.40	6.00

Size.....Inches	4	4½	5	6	7	8	9	10	12
Size.....Millimeters	100	113	125	150	175	200	225	250	300
Price.....Each	3.50	5.10	6.00	8.00	13.50	19.25	26.00	38.50	58.00
Price, Galvanized...Each	7.00	10.20	12.00	16.00	27.00	38.50	52.00	77.00	116.00

See pages 692 and 693 for list of Reducing Crosses carried in stock.

REDUCERS

CAST IRON

CODE: GOGUENARDE

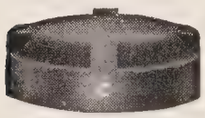
Size.....Inches	4½	5	6	7	8	9	10	12
Size.....Millimeters	113	125	150	175	200	225	250	300
Price.....Each	1.85	2.00	2.70	5.35	6.75	8.35	10.00	15.00
Price, Galvanized.....Each	3.70	4.00	5.40	10.70	13.50	16.70	20.00	30.00

ECCENTRIC REDUCERS

CAST IRON

CODE: GONATOPUS

Size.....Inches	1¼	1½	2	2½	3	3½	4	4½	5	6	7	8
Size....Millimeters	32	38	50	64	76	90	100	113	125	150	175	200
Price.....Each	.55	.72	1.00	1.50	2.40	3.00	4.00	5.00	6.00	8.00	9.00	11.00

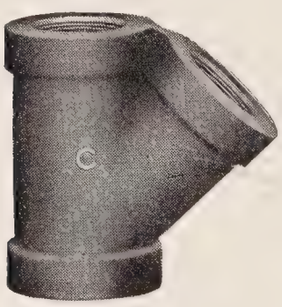


CODE: GOROVINHAS

CAPS

CAST IRON

Size.....Inches	4	4½	5	6	7	8	9	10	12
Size.....Millimeters	100	113	125	150	175	200	225	250	300
Price.....Each	.87	1.05	1.20	1.55	2.50	2.85	4.75	5.50	7.00
Price, Galvanized..Each	1.74	2.10	2.40	3.10	5.00	5.70	9.50	11.00	14.00



CODE: GOSWINTHA

Y BENDS

(LATERAL)

CAST IRON

Size.....Inches	½	¾	1	1¼	1½	2	2½	3	3½
Size.....Millimeters	13	19	25	32	38	50	64	76	90
Price.....Each	.20	.28	.34	.54	.66	.94	1.66	2.50	3.50
Price, Galvanized..Each	.40	.56	.68	1.08	1.32	1.88	3.32	5.00	7.00
Size.....Inches	4	4½	5	6	7	8	10	12	
Size.....Millimeters	100	113	125	150	175	200	250	300	
Price.....Each	4.00	5.90	7.00	9.20	15.60	22.50	45.00	67.00	
Price, Galvanized..Each	8.00	11.80	14.00	18.40	31.20	45.00	90.00	134.00	

LOCK NUTS

CAST IRON

CODE: GRACULINA

Size.....Inches	2½	3	3½	4	4½	5
Size.....Millimeters	64	76	90	100	113	125
Price.....Each	.27	.34	.47	.64	.85	.90
Price, Galvanized.....Each	.54	.68	.94	1.28	1.70	1.80
Size.....Inches	6	7	8	9	10	12
Size.....Millimeters	150	175	200	225	250	300
Price.....Each	1.30	1.70	2.35	2.70	3.00	4.00
Price, Galvanized.....Each	2.60	3.40	4.70	5.40	6.00	8.00

The Threads of our Hexagon Lock Nuts conform to the American Standard Lock Nut Thread.

INLET

CODE: GRAFFIGNER

MEDIUM SWEEP

REDUCING DOUBLE BRANCH ELBOWS

NO. 7. CAST IRON.

Size.....Inches	1x1x1¼	1¼x1¼x1½	1½x1½x2	2x2x2½
Size.....Millimeters	25x25x32	32x32x38	38x38x50	50x50x38
Price.....Each	.75	1.05	1.50	2.25
Size.....Inches	2½x2½x3	3x3x4	4x4x5	5x5x6
Size.....Millimeters	64x64x76	76x76x100	100x100x125	125x125x150
Price.....Each	4.25	6.50	12.00	16.50

In describing Medium Reducing Double Branch Elbows, the Run is first named, then the Inlet.

CODE: GRAFSTEDEN

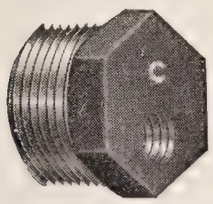
BUSHINGS

CAST IRON

REDUCING TWO OR MORE SIZES, UP TO 2 1-2-INCH, INCLUSIVE
REDUCING ONE OR MORE SIZES, 3-INCH AND UP

Size.....Inches	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2
Size.....Millimeters	10	13	19	25	32	38	50	64	76	90
Price.....Each	.04	.04	.05	.06	.07	.09	.14	.21	.30	.40
Price, Galvanized.....Each	.08	.08	.10	.12	.14	.18	.28	.42	.60	.80

Size.....Inches	4	4 1/2	5	6	7	8	9	10	12	
Size.....Millimeters	100	113	125	150	175	200	225	250	300	
Price.....Each	.50	.75	.93	1.25	1.87	2.75	3.25	3.75	5.00	
Price, Galvanized.....Each	1.00	1.50	1.85	2.50	3.75	5.50	6.50	7.50	10.00	



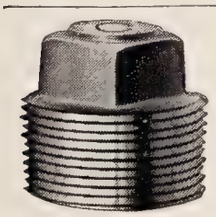
CODE: GREGABITIS

ECCENTRIC BUSHINGS

CAST IRON

Size.....Inches	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2
Size.....Millimeters	32	38	50	64	76	90	100	113
Price.....Each	.22	.25	.27	.42	.60	.80	1.00	1.50

Size.....Inches	5	6	7	8	9	10	12	
Size.....Millimeters	125	150	175	200	225	250	300	
Price.....Each	1.85	2.50	3.75	5.50	6.50	7.50	10.00	



SQUARE HEAD
CODE: GRELLAUGIG

PLUGS

CAST IRON

COUNTERSUNK
CODE: GRIMPAVAM

SQUARE HEAD

Size.....Inches	1/8	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3
Size.....Millimeters	3	6	10	13	19	25	32	38	50	64	76
Price.....Each	.02	.02	.02	.02	.03	.04	.05	.07	.10	.18	.25
Price, Galvanized Each	.04	.04	.04	.04	.06	.08	.10	.14	.20	.36	.50
Price, Tapped for Air Cock. Each					.12	.15	.20	.25	.30		
Price, L. H. Plugs Each				.04	.06	.08	.09	.11	.15		
Price, Solid Plugs Each		.04	.04	.04	.06	.08	.09	.11	.15	.27	.38

Size.....Inches	3 1/2	4	4 1/2	5	6	7	8	9	10	12	
Size.....Millimeters	90	100	113	125	150	175	200	225	250	300	
Price.....Each	.38	.42	.65	.88	1.20	1.85	2.75	3.25	3.75	5.00	
Price, Galvanized Each	.76	.84	1.30	1.75	2.40	3.70	5.50	6.50	7.50	10.00	
Price, Solid Plugs Each	.57	.63	1.00	1.35	*1.80		*4.15		*5.75	*7.50	

*These sizes are the Bar Type.

COUNTERSUNK

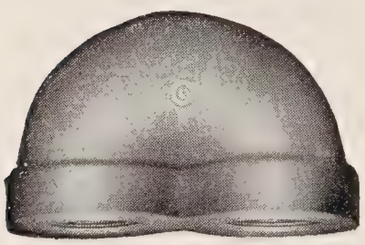
Size.....Inches	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2
Size.....Millimeters	6	10	13	19	25	32	38
Price.....Each	.04	.04	.04	.06	.08	.09	.11

Size.....Inches	2	2 1/2	3	3 1/2	4	5	6
Size.....Millimeters	50	64	76	90	100	125	150
Price.....Each	.15	.30	.40	.92	1.10	2.00	3.50

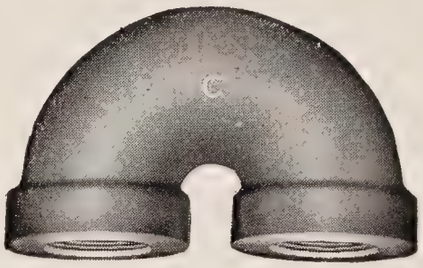
RETURN BENDS

CAST IRON

CLOSE



OPEN



RETURN BENDS, CLOSE PATTERN
CAST IRON

CODE: GRINGOLADO

Size.....Inches	½	¾	1	1¼	1½	2	2½	3	4
Size.....Millimeters	13	19	25	32	38	50	64	76	100
Price, Right Hand.....Each	.18	.20	.22	.28	.40	.57	1.20	1.70	5.00
Price, Right and Left.....Each	.21	.23	.26	.33	.46	.66	1.40	1.95	5.25
Price, Left Hand.....Each	.21	.23	.26	.33	.46	.66	1.40	1.95	5.25
Price, Right Hand, Galv....Each	.36	.40	.44	.56	.80	1.14	2.40	3.40	10.00
Center to Center.....Inches	1¼	1½	1¾	2¼	2½	3¼	3¾	4¼	6

Close Pattern Return Bends will not make up parallel coils, as the distance, center to center, of two adjacent bends is greater than the center to center of openings of a single bend.

RETURN BENDS, CLOSE PATTERN, PITCHED
CAST IRON

SUITABLE FOR COILS AS PER TABLE BELOW

CODE: GRUFOLIAMO

Size.....Inches	1	1	1	1	1	1¼	1¼	1¼
Size.....Millimeters	25	25	25	25	25	32	32	32
Length of Pipe in Coil.....Feet	3	4	5	6	8	4	5	6
Price, Right Hand.....Each	.26	.26	.26	.26	.26	.33	.33	.33

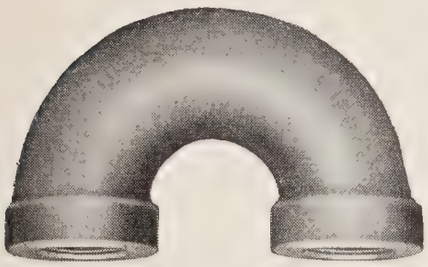
All Right and Left Pitched Return Bends are made to order.
One inch Return Bends for coils longer than 8 feet are tapped without pitch.
Pitched Return Bends have length of coils marked on them.

RETURN BENDS, OPEN PATTERN
CAST IRON

CODE: GRUMELEUX

Size.....Inches	¾	1	1¼	1½	2	2½	3	4
Size.....Millimeters	19	25	32	38	50	64	76	100
Price, Right Hand.....Each	.26	.30	.40	.55	.80	1.35	2.20	6.50
Price, Right and Left.....Each	.30	.35	.46	.64	.92	1.55	2.50	
Price, Right Hand, Galv..Each	.52	.60	.80	1.10	1.60	2.70	4.40	10.00
Center to Center.....Inches	1⅞	2⅜	3	3½	4½	5½	6½	7½

FOR OTHER CAST IRON RETURN BENDS OF VARYING CENTERS, SEE EXTRA HEAVY CAR HEATER PATTERN, PAGE 404.



CODE: GUADRAMANA

RETURN BENDS

CAST IRON

WIDE PATTERN

RIGHT HAND

WITH UNION ENDS
CODE: GUEDEJILLA

Size.....Inches	1	1	1	1	1	1¼	1¼	1¼
Size.....Millimeters	25	25	25	25	25	32	32	32
Price.....Each	.45	.50	.60	.75	1.00	1.00	1.25	*
Price, Galvanized.....Each	.80	.90	1.10	1.30	1.60	1.75	2.00	*
Center to Center.....Inches	3	4	5	6	8	4	6	8
Size.....Inches	1½	1½	1½	2	2	2	2	4
Size.....Millimeters	38	38	38	50	50	50	50	100
Price.....Each	1.30	1.60	2.00	1.75	2.00	3.00	3.50	7.50
Price, Galvanized.....Each	2.30	2.60	3.25	3.00	3.25	4.50	5.00	11.00
Center to Center.....Inches	4⅞	6	8	4⅞	6	7	8	11

*See page 404 for price of 1¼x8 Return Bend.

WITH UNION ENDS

Size.....Inches	1¼	2
Size.....Millimeters	32	50
Price.....Each	1.60	3.00
Center to Center.....Inches	4⅝	6

CODE: GUEDOUFLE

RETURN BENDS

BACK OUTLET

CAST IRON

Size.....Inches	¾	1	1¼	1½	2	2½	3
Size.....Millimeters	19	25	32	38	50	64	76
Price, Right Hand.....Each	.38	.42	.60	.80	1.15	2.00	3.00
Price, Right and Left.....Each	.42	.48	.70	.95	1.30	2.30	3.50
Price, Right Hand, Galvanized. Each	.76	.84	1.20	1.60	2.30	4.00	6.00
Center to Center.....Inches	1⅞	2¼	2¼	2½	3¼	3¾	4¼

RETURN BENDS, BACK OUTLET

CAST IRON

SPECIAL PATTERNS: MADE TO ORDER ONLY

Size.....Inches	1	1¼	1½	2
Size.....Millimeters	25	32	38	50
Center to Center.....Inches	4	3¼	4	4
Size, Back Outlet.....Inches	1¼	1½	1½	1½

The back outlet of Right and Left Return Bends is always tapped right hand.

BRANCH TEES

CAST IRON

FOR STEAM WORKING PRESSURES UP TO 100 POUNDS

BRANCHES R. H.

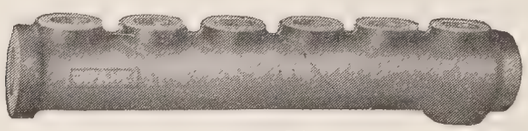
RUN OPEN R. H.

RUN OPEN R. H.

No. 1*
CODE: GUGNETTINO

BRANCHES R. H.

INLET OPEN R. H.

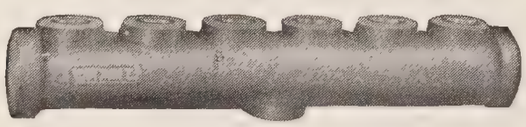


CLOSED

No. 2* OUTLET OPEN R. H.
CODE: HACHASSENT

BRANCHES L. H.

CLOSED



CLOSED

INLET OPEN R. H.
No. 3*
CODE: HAIHAKEN

The run and back opening of Branch Tees are tapped the same size as branches, unless otherwise ordered.

No. of Branches	1 In. Branch Tees 25 M. Branch Tees			1¼ In. Branch Tees 32 M. Branch Tees			1½ In. Branch Tees 38 M. Branch Tees			2 In. Branch Tees 50 M. Branch Tees		
	2½ In. Center to Center			3 In. Center to Center			3½ In. Center to Center			4½ In. Center to Center		
	1 in. or 1¼ in. Run	1½ in. Run	2 in. Run	1¼ in. or 1½ in. Run	2 in. Run	2½ in. Run	1½ in. or 2 in. Run	2½ in. Run	3 in. Run	2 in. Run	2½ in. or 3 in. Run	3½ in. Run
2	.90	1.00	1.15	1.30			2.10			4.10		
3	1.05	1.15	1.35	1.65	1.90	2.40	2.70	3.45	3.80	5.25	5.75	6.25
4	1.15	1.30	1.60	2.00	2.40	2.85	3.35	4.15	4.60	6.40	7.00	7.75
5	1.35	1.45	1.85	2.40	2.90	3.55	4.00	5.00	5.50	7.65	8.50	9.25
6	1.60	1.75	2.10	2.80	3.30	3.95	4.65	5.75	6.25	8.80	9.75	10.75
7	1.90	2.20	2.45	3.20	3.90	4.20	5.25	6.50	7.25	10.60	11.75	13.00
8	2.20	2.45	2.75	3.60	4.50	4.95	5.85	7.00	7.75	11.50	12.75	14.00
9	2.65	2.90	3.40	4.30	5.25	6.15	6.50	8.25	9.00	12.25	13.50	15.00
10		3.30	4.00	4.80	5.85	6.85	7.60	9.25	10.00	13.50	15.00	16.50
11		4.50	4.80	5.00	6.25	7.25	8.00	9.75	10.75			
12		4.75	5.10	5.25	6.50	7.65	8.50	10.50	11.50			
13		5.50	6.00	6.00	7.00	8.25						
14		7.00	7.25	6.75	7.75	9.00						
15		7.50	7.75	7.50	8.50	9.75						
16		8.00	8.25	8.50	9.50	10.75						

BACK OR SIDE OUTLETS CHARGED AS ADDITIONAL FRONT OUTLETS

*Nos. 1 and 2 Branch Tees with branches tapped left hand, and No. 3 Branch Tees with branches tapped right hand, can be furnished at the regular prices.

1 inch Branch Tees, 1 inch or 1¼ inch run, are 1¾ inches inside diameter. 1 inch Branch Tees, 1½ inch or 2 inch run, are 2¼ inches inside diameter.

1¼ inch Branch Tees are all 2½ inches inside diameter.

1½ inch Branch Tees are all 2¾ inches inside diameter.

2 inch Branch Tees are all 3½ inches inside diameter.

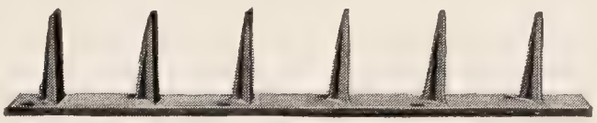
Always order Branch Tees by size and number.

HOOK PLATES AND BEAM HOOKS

HOOK PLATES

CODE: HALSMARTER

Number of Hooks	1	2	3	4	5	6
For 1-in. pipe, 2½ ins. between centers ..... Each	.09	.18	.23	.26	.32	.38
For 1¼-in. pipe, 3 ins. between centers ..... Each	.10	.21	.27	.32	.41	.52
For 1½-in. pipe, 3½ ins. between centers .... Each	.15	.28	.43	.58	.72	.88
For 2-in. pipe, 4½ ins. between centers ..... Each	.22	.43	.65	.90	1.15	1.35

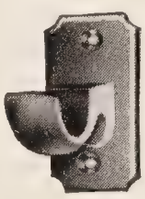


EXPANSION HOOK PLATES

CODE: HAMAQUERO

Number of Hooks	1	2	3	4	5	6
For 1-in. pipe, 2½ ins. between centers ..... Each	.15	.25	.35	.50	.60	.70
For 1¼-in. pipe, 3 ins. between centers ..... Each	.17	.27	.40	.60	.70	.80
For 1½-in. pipe, 3½ ins. between centers .... Each	.25	.40	.60	.75	.90	1.00
For 2-in. pipe, 4½ ins. between centers ..... Each		.60	.85	1.00	1.35	1.55

When Hook Plates are ordered, specifying a greater number of hooks than listed above, we will send two; for instance, an order calling for two 2x8 hook plates, we will send four 2x4.

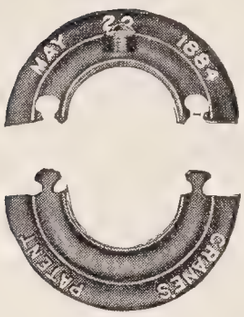


BEAM HOOKS, LONG SHANK

CODE: HANDBERDIG

Size ..... Inches	½	¾	1	1¼	1½	2	2½	3
Size ..... Millimeters	13	19	25	32	38	50	64	76
Price ..... Each	.13	.15	.18	.22	.24	.35	.65	.90

CAST IRON FLOOR AND CEILING PLATES



No. 4
CODE: HANDBUIGER

CEILING PLATES

FOR WROUGHT PIPE

This simple device enables the steamfitter to put up the pipe first, then the plates afterward, thereby saving a great deal of labor and annoyance, as is the case in using the old style, which is made in one piece.

Care is taken to insure perfect fit, each piece being interchangeable.

Size.....Inches	¾	1	1¼	1½	2	2½	3	3½	4	5	6	8
Size....Millimeters	19	25	32	38	50	64	76	90	100	125	150	200
Price.....Each	.22	.28	.32	.40	.50	.65	.90	1.00	1.20	2.00	2.50	3.75

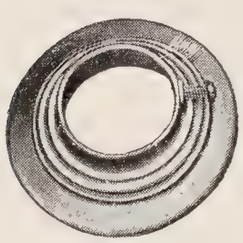
No. 5
FLOOR PLATE
CODE: HANDKURBIS

FLOOR AND CEILING PLATES

ONE PIECE

No. 7
CEILING PLATE
CODE: HANEGUILLA

Size.....Inches	½	¾	1	1¼	1½	2	2½
Size.....Millimeters	13	19	25	32	38	50	64
Floor Plates.....Each	.06	.06	.08	.11	.14	.16	.24
Ceiling Plates.....Each	.11	.13	.16	.18	.23	.27	.36



No. 8
CODE: HANEVEDER

CEILING PLATES

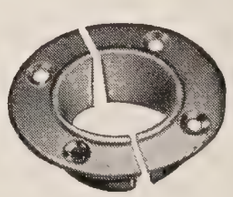
IN ONE PIECE

Size.....Inches	3	3½	4	5	6
Size.....Millimeters	76	90	100	125	150
Price.....Each	.50	.55	.68	.95	1.25

No. 9
CODE: HANFBLUTEN

CRANE FLOOR PLATES

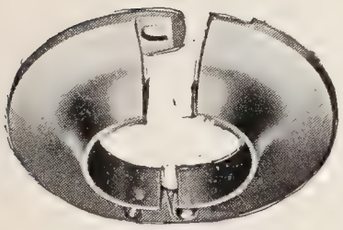
This Floor Plate is made with grooves on the under side of the flange, as shown in cut, in order that it may be easily parted by a slight blow when required to be used in halves.



No. 9

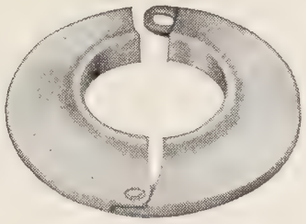
Size.....Inches	½	¾	1	1¼	1½	2	2½	3	3½	4	5	6	8
Size.....Millimeters	13	19	25	32	38	50	64	76	90	100	125	150	200
Price.....Each	.06	.06	.08	.11	.14	.16	.24	.30	.35	.42	.60	.75	1.75

FLOOR AND CEILING PLATES



NO. 3
CEILING PLATE
CAST

CODE: HANFKORNER



NO. 6
FLOOR PLATE
CAST

CODE: HANFSORTEN

NO. 10

PRESSED STEEL

CODE: HANGEDOHNE

Price List Nos. 3, 6 and 10—Nickel Plated

Size.....Inches	½	¾	1	1¼	1½	2	2½	3
Size.....Millimeters	13	19	25	32	38	50	64	76
Price.....Each	.27	.28	.32	.35	.38	.45	.65	.80

Larger sizes, prices on application.

CRANE TELESCOPING

FIRE-PROOF FLOOR SLEEVES

GALVANIZED SHEET IRON

WITH NEAT CAST IRON FLANGE ON TOP AND BOTTOM

Easily adjusted to any permanent position within its range of length. Has no screws, slots or springs to get out of order.

We have designed these Galvanized Sheet Iron Floor Sleeves to meet the demand for a cheaper article than Cast Iron Floor Sleeves.

NO. 1

CODE: HANGEPFAHL

Size of Pipe.....Inches	¾	1	1¼
Size.....Millimeters	19	25	32
Minimum Length.....Inches	12	12	12
Maximum Length.....Inches	17	17	17
Price No. 1.....Each	1.00	1.10	1.30

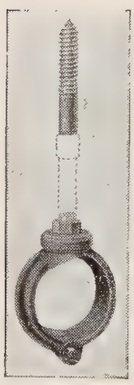
NO. 2

CODE: HANGEWAND

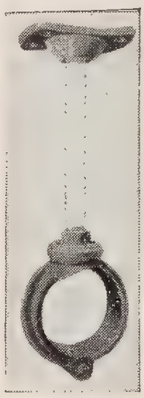
Size of Pipe. Inches	¾	1	1¼	1½	2	2½	3	3½	4	5	6	8
Size...Millimeters	19	25	32	38	50	64	76	90	100	125	150	200
Minimum Length..Inches	14	14	14	14	14	14	14	14	14	14	14	14
Maximum Length..Inches	24	24	24	24	24	24	24	24	24	24	24	24
Price No. 2..Each	1.05	1.20	1.35	1.50	1.80	2.10	2.50	3.00	3.75	4.50	5.25	6.75

EXPANSION PIPE HANGERS

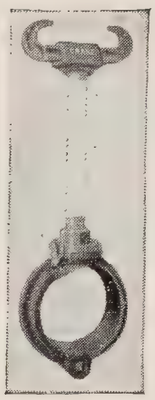
WITH SECTIONAL RING



STYLE R
FOR 8-INCH AND SMALLER PIPE WITH LAG SCREW
CODE: HANNOUART



STYLE S
FOR 8-INCH AND SMALLER PIPE WITH CEILING PLATE
CODE: HANTOLINA



STYLE SS
FOR 8-INCH AND SMALLER PIPE WITH BEAM CLAMP
CODE: HAPPELOPIN

PRICE LIST, STYLES R AND S

Size ... Inches	¾	1	1¼	1½	2	2½	3
Price ... Each	.32	.33	.35	.45	.55	.65	.80
Size of Pipe Rings and Buttons are Tapped for ... Inches	⅛	⅛	⅛	¼	¼	¼	⅜
Size ... Inches	3½	4	4½	5	6	7	8
Price ... Each	1.00	1.15	1.60	2.00	2.50	3.00	3.75
Size of Pipe Rings and Buttons are Tapped for ... Inches	⅜	⅜	⅜	¾	¾	¾	¾

PRICE LIST, STYLE SS WITH BEAM CLAMP

Size ... Inches	¾	1	1¼	1½	2	2½	3
Price ... Each	1.00	1.00	1.05	1.15	1.25	1.35	1.50
Size of Pipe Rings and Buttons are Tapped for ... Inches	⅛	⅛	⅛	¼	¼	¼	⅜
Beam Clamp Only ... Each	.75	.75	.75	.75	.75	.75	.75
Size ... Inches	3½	4	4½	5	6	7	8
Price ... Each	1.70	1.85	3.35	3.75	4.25	4.75	5.50
Size of Pipe Rings and Buttons are Tapped for ... Inches	⅜	⅜	⅜	¾	¾	¾	¾
Beam Clamp Only ... Each	.75	.75	.75	1.75	1.75	1.75	1.75

Prices do not include pipe from lag screw, ceiling plate, or beam clamp to ring.

Pipe can be run and supported upon temporary wood hangers, and when in proper line these Sectional Hangers can be conveniently applied.

CODE: HARAFORAS

BEAM CLAMPS

PATENTED

Number ...	1000	2000	4000	6000
Price ... Each	.75	1.75	3.75	6.00
Size of Pipe Supported ... Inches	4½ & smaller	5 to 8	9 to 14	15 to 24
Size of Pipe Hub is Tapped for ... Inches	⅛–¼–⅜–½	¾		
Size of Rod Hub is Tapped for ... Inches	⅜–½–⅝	¾	⅞–1	1¼–1⅜
Width of Beam Flange Clamp will Fit ... Inches	2¾– to 7	3½ to 7½	4¼ to 7½	4½ to 8½

When ordering, give Catalogue No. and SIZE OF TAPPING in hub; also state whether tapping is to be for PIPE or ROD.

The Numbers 1000, 2000, 4000 and 6000 designates the safe load in pounds the beam clamp will carry.

EXPANSION PIPE HANGERS

WITH SOLID RING

FOR 8-INCH AND SMALLER PIPE WITH CEILING PLATE

CODE: HARAUDER

Size.....Inches	½	¾	1	1¼	1½	2	2½	3
Size.....Millimeters	13	19	25	32	38	50	64	76
Price, Complete.....Each	.17	.17	.18	.19	.25	.29	.36	.44
Price, Rings.....Each	.08	.08	.12	.15	.20	.25	.30	.40
Price, Plates.....Each	.08	.08	.08	.08	.09	.09	.10	.10
Price, Buttons.....Each	.06	.06	.06	.06	.07	.07	.08	.08
Size of Pipe, Rings and Buttons are Tapped for.....Inches	¼	⅜	⅜	⅜	⅜	⅜	½	½

Size.....Inches	3½	4	4½	5	6	7	8	
Size.....Millimeters	90	100	113	125	150	175	200	
Price, Complete.....Each	.55	.63	.90	1.12	1.35	1.80	2.25	
Price, Rings.....Each	.50	.60	.80	1.00	1.25	1.70	2.15	
Price, Plates.....Each	.10	.10	.10	.10	.10	.10	.10	
Price, Buttons.....Each	.08	.08	.08	.08	.08	.08	.08	
Size of Pipe, Rings and Buttons are Tapped for.....Inches	½	½	½	¾	¾	¾	¾	

Prices do not include pipe from ceiling plate to ring; this will be at an extra price and furnished only when so specified. If pipe is desired, state distance from center of pipe to support.

ADJUSTABLE STEEL PIPE HANGERS

RING AND BOLT
CODE: HARENTWEGE

EXTENSION BAR
CODE: HARNRUTHE
Furnished in 5 or 10-foot lengths.

Size.....Inches	½	¾	1	1¼	1½	2	2½	3	3½	4	4½	5	6
Size.....Millimeters	13	19	25	32	38	50	64	76	90	100	113	125	150
Ring and Bolt.....Each	.08	.08	.09	.10	.12	.14	.16	.18	.20	.25	.30		

Extension Bar.....No.	11	12	13	14	15
Width.....Inches	⅞	⅞	1	1⅛	1¼
Price.....Per Foot	.08	.09	11	.12	

GAS FITTERS' HOOKS

WROUGHT IRON

P. C. List

CODE: HARONEARON

TINNED STRAPS

CODE: HARPAGAREM

Size.....Inches	¼	⅜	½	¾	1	1¼	1½	2
Size.....Millimeters	6	10	13	19	25	32	38	50
Hooks.....Per 100		.55	.65	.80	1.00	1.30	1.60	2.00
Straps.....Per lb.	.18	.18	.18	.18	.18	.18	.18	.18

EXPANSION PIPE HANGERS

STYLE J
FOR 4-INCH AND LARGER PIPE WITH BEAM CLAMP
CODE: HARPAILLAS

STYLE T
FOR 8-INCH AND SMALLER PIPE WITH BEAM CLAMP
CODE: HARPOADOR

STYLE T
FOR 9-INCH AND LARGER PIPE WITH BEAM CLAMP
CODE: HARSDRACHT

PRICE LIST STYLE J HANGER, 4-INCH AND LARGER

Size	Inches	4	5	6	8	9	10	12	14
Size	Millimeters	100	125	150	200	225	250	300	350
Price	Each	3.00	4.00	4.50	5.00	5.50	6.00	7.00	10.00
Size of Eye Bolt for Turnbuckle	Inches	5/8	5/8	3/4	3/4	7/8	7/8	1	1
Beam Clamp only	Each	.75	1.75	1.75	1.75	3.75	3.75	3.75	3.75

Price includes Beam Clamp but not Turnbuckle or Rod from Beam Clamp to Turnbuckle.

PRICE LIST STYLE T, 8-INCH AND SMALLER

Size	Inches	1	1¼	1½	2	2½	3	3½
Size	Millimeters	25	32	38	50	64	76	90
Price	Each	.90	1.00	1.10	1.25	1.50	1.75	2.00
Size of Pipe Tap in Yoke	Inches	3/8	3/8	3/8	3/8	½	½	½
Beam Clamp only	Each	.75	.75	.75	.75	.75	.75	.75

Size	Inches	4	4½	5	6	7	8
Size	Millimeters	100	113	125	150	175	200
Price	Each	2.25	2.50	3.00	3.50	4.00	5.00
Size of Pipe Tap in Yoke	Inches	½	½	¾	¾	¾	¾
Beam Clamp only	Each	.75	.75	1.75	1.75	1.75	1.75

Price includes Beam Clamp, but not Pipe from Beam Clamp to Yoke.

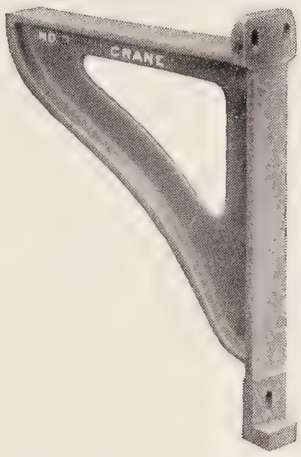
Style T for pipe 8 inches and smaller can be furnished with lag screw or ceiling plate similar to styles R and S.

PRICE LIST STYLE T, 9-INCH AND LARGER

Size	Inches	9	10	12	14
Size	Millimeters	225	250	300	350
Price	Each	14.00	15.00	17.00	20.00
Size of Eye Bolt for Turnbuckle	Inches	7/8	7/8	1	1
Beam Clamp only	Each	3.75	3.75	3.75	3.75

Price includes Beam Clamp but not Turnbuckle or Rod from Turnbuckle to Beam Clamp.

WALL BRACKETS



STANDARD PATTERN
CODE: HARTAPFEL

Size.....Number	21	22	23	24	25	26
Price.....Each	11.00	18.00	22.00	29.00	45.00	55.00
Size of Pipe Will Support In.	4 and smaller	4½ to 6	7 to 8	9 to 10	12	14 to 15
Safe Load....Tons	½	¾	1	1¼	1½	2

VIEW OF NO. 14 BRACKET WITH WALKING-BOARD ATTACHMENT

HEAVY PATTERN
(PATENTED)
CODE: HARTELIJK

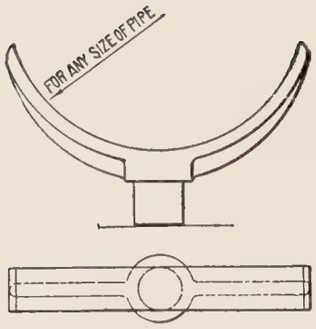
Size.....Number	11	12	13	14	15
Price.....Each	41.00	58.00	78.00	105.00	155.00
Size of Pipe Will Support.....Inches	5 to 8	9 to 14	15 to 18	20 to 24	20 to 30
Safe Load.....Tons	1	2	3	4	5

Walking-Board Attachment for 12-inch Board.....Each 7.25

These Brackets are furnished without the Walking-Board Attachment, unless otherwise specified.

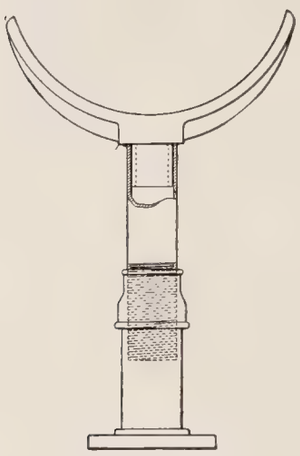
For general dimensions see page 649.

PIPE SUPPORTS



STYLE G

CODE: HARTETROG



STYLE H

CODE: HARTKWALEN

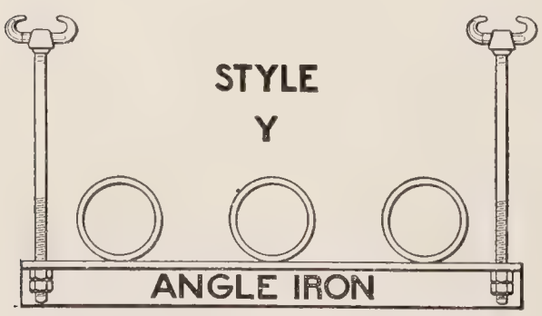
ADJUSTABLE PIPE SUPPORT NO PIPE FURNISHED

CODE: HARTMANGAN

Size.....Inches	2	2½	3	3½	4	4½	5	6	7	8
Size.....Millimeters	50	64	76	90	100	113	125	150	175	200
Style G.....Each	.80	.90	1.00	1.10	1.20	1.35	1.55	1.80	2.25	2.70
Style ZZ.....Each			6.00	6.50	7.00	7.25	7.50	8.00	8.50	9.00
Shank fits Standard Pipe..Ins.	1	1	1¼	1¼	1½	1½	1½	2	2	2
Size.....Inches	9	10	12	14	15	16	18	20	22	24
Size.....Millimeters	225	250	300	350	375	400	450	500	550	600
Style G.....Each	3.00	3.35	3.55	4.00	4.65	5.35	6.65	8.35	9.50	11.25
Style ZZ.....Each	10.00	12.00	13.00	14.00		15.00	19.00	24.00		30.00
Shank fits Standard Pipe..Ins.	2	2½	2½	3	3	3	3½	3½	4	4

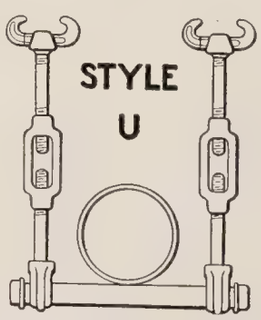
These Supports will be made to order with any other style or size Shank at special prices.

Style "H" Adjustable Pipe Support, for any size pipe and any height. Orders or inquiries should state distance from centre of pipe to floor. Prices on application.



ADJUSTABLE ANGLE IRON HANGER FOR ONE OR MORE PIPES

CODE: HARTSEHNIG



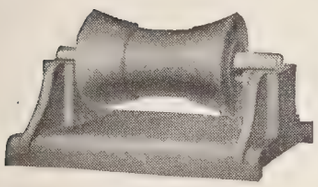
ADJUSTABLE HANGER FOR ONE OR MORE PIPES

CODE: HARTTRABEN

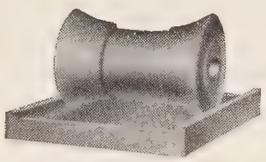
Styles U and Y Pipe Hangers are made to order only. Drawings must accompany orders or inquiries showing location and duty of hanger.

Prices on application.

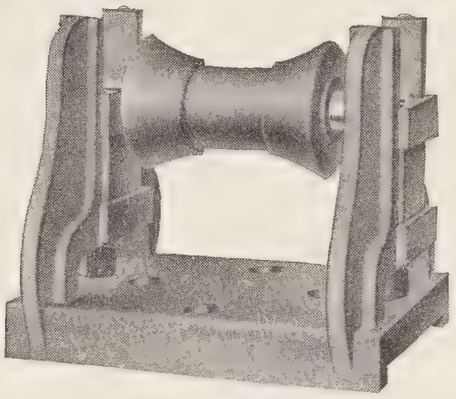
PIPE SUPPORTS



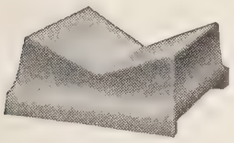
STYLE C
CODE: HARTWERDEN



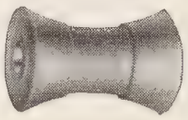
STYLE D
CODE: HASARDAIT



STYLE W
ADJUSTABLE ROLL AND STAND
SIZE 4 TO 24 INCHES
CODE: HASENADLER



STYLE F
CODE: HASELEULEN



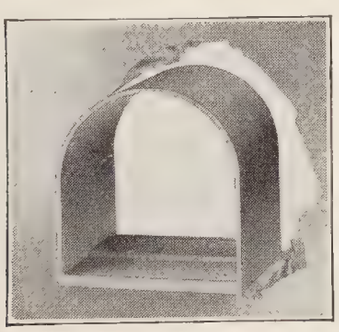
ROLL

Pipe Size.....Inches	1 to 2½	3 to 3½	4 to 6	7 to 10
Pipe Size.....Millimeters	25 to 64	76 to 90	100 to 150	175 to 250
Style C.....Each	2.25	2.80	2.80	5.00
Style D.....Each			2.25	4.25
Style F.....Each			3.35	3.90
Style W.....Each			8.50	13.00
Rolls only, Style C.....Each	.80	1.15	1.15	2.25
Rolls only, Style D.....Each			.90	2.00

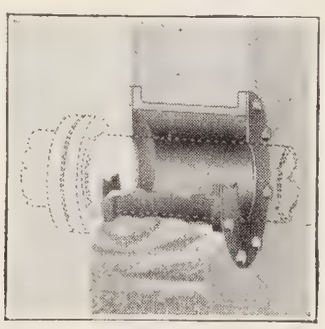
Pipe Size.....Inches	12 to 15	16 to 20	22 to 24
Pipe Size.....Millimeters	300 to 375	400 to 500	550 to 600
Style C.....Each	6.75	8.50	10.25
Style D.....Each	6.00	7.75	8.50
Style F.....Each	4.45	6.75	6.75
Style W.....Each	18.00	24.00	
Rolls only, Style C.....Each	3.40	5.40	6.80
Rolls only, Style D.....Each	3.10	5.10	6.00

In ordering always give size of pipe.

For combinations with Wall Brackets, see page 378.



No. 6 WALL ARCH
CODE: HASHMONAH



No. 10 WALL SLEEVE
CODE: HASINNEN

No. 6 Wall Arch for pipe 12-inch and smaller.

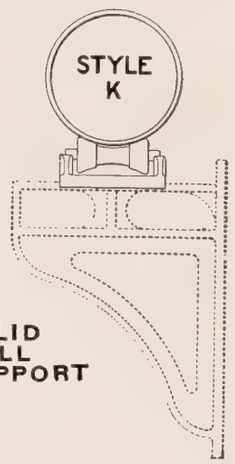
No. 10 Wall or Floor Sleeve for pipe 10-inch and smaller. The sleeve proper is 18 inches inside diameter, the end covers fit close around the pipe.

Orders or inquiries should state thickness of wall or floor.

PRICES ON APPLICATION

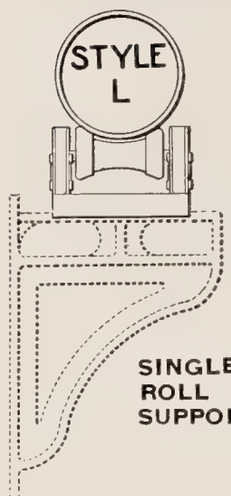
PIPE SUPPORTS

(PATENTED)



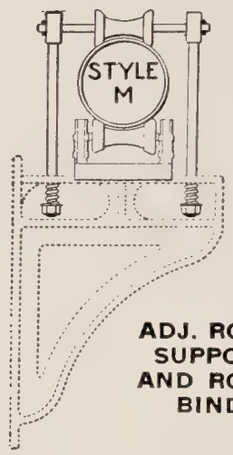
SOLID ROLL SUPPORT

CODE: HASPELFANG



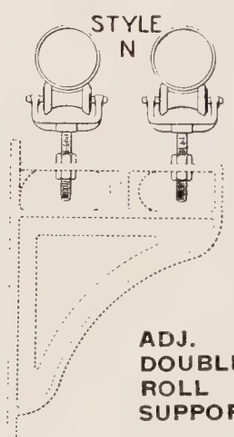
SINGLE ROLL SUPPORT

CODE: HASTEADO



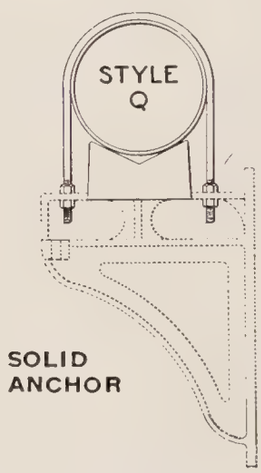
ADJ. ROLL SUPPORT AND ROLL BINDER

CODE: HATTEMIST



ADJ. DOUBLE ROLL SUPPORT

CODE: HAUBANONS



SOLID ANCHOR

CODE: HAUBUCHE

Style "Q" Anchor should be stayed from the sides by tie rods extending diagonally from the wall to the outside edge of the bracket. Provision is made on the bracket for attaching these tie rods.

Pipe Size.....Inches	4 to 6	7 to 10	12 to 15	16 to 20	22 to 24
Pipe Size...Millimeters	100 to 150	175 to 250	300 to 375	400 to 500	550 to 600
Style K.....Each	2.80	5.00	6.75	8.50	10.25
Style L.....Each	7.75	9.25	11.25	12.75	14.00
Style M.....Each	17.00	20.00	24.00	27.00	30.00
Style N.....Each	17.00	20.00	24.00	27.00	30.00
Style Q.....Each	7.75	8.50	9.25	9.75	10.25

The above prices are for supports only. Add the price of bracket wanted. Prices of brackets, page 375.

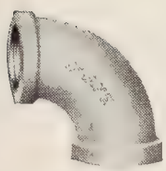
In ordering always specify size of pipe, style of support and style of bracket required and whether bracket and support or bracket only is required.

LONG SWEEP FITTINGS

CAST IRON

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS

FOR WATER WORKING PRESSURES UP TO 150 POUNDS



No. 1
ELBOW

CODE: HAUFLINGEN

No. 2
DOUBLE BRANCH
ELBOW

CODE: HAUSHAMMEL

No. 3
TEE

CODE: HAYDOUKS

No. 4
CROSS

CODE: HEBDOMON

No. 5
TEE

CODE: HEBESCAMUS

Size.....Inches	¾	1	1¼	1½	2	2½	3	3½	4
Size.....Millimeters	19	25	32	38	50	64	76	90	100
No. 1 Elbows.....Each	.26	.32	.40	.55	.80	1.20	2.25	3.25	3.50
No. 1 Elbows, Reducing.....Each	.40	.48	.60	.83	1.20	1.80	3.38	4.88	5.25
No. 2 Double Branch Elbows Each		.64	.80	1.10	1.60	2.40	4.50	6.50	7.00
No. 2 Double Branch Elbows, Reducing..Each		.96	1.20	1.65	2.40	3.60	6.75	9.75	10.50
No. 5 Tees.....Each		.64	.80	1.10	1.60	2.40	4.50	6.50	7.00
No. 5 Tees, Reducing.....Each		.96	1.20	1.65	2.40	3.60	6.75	9.75	10.50
No. 3 Tees.....Each		.48	.60	.82	1.20	1.80	3.40	4.90	5.25
No. 3 Tees, Reducing.....Each		.72	.90	1.23	1.80	2.70	5.10	7.35	7.88
No. 4 Crosses.....Each		.85	1.10	1.50	2.15	3.20	6.00	8.75	9.50
No. 4 Crosses, Reducing.....Each			1.65	2.25	3.23	4.80	9.00	13.13	14.25

Size.....Inches	4½	5	6	7	8	9	10	12
Size.....Millimeters	113	125	150	175	200	225	250	300
No. 1 Elbows.....Each	5.50	6.50	8.75	13.00	17.00	25.50	30.00	40.00
No. 1 Elbows, Reducing .....Each	8.25	9.75	13.13	19.50	25.50	38.25	45.00	60.00
No. 2 Double Branch Elbows ..Each	11.00	13.00	17.50	26.00	34.00	51.00	60.00	80.00
No. 2 Dbl. Branch Elb., Reducing. Each	16.50	19.50	26.25	39.00	51.00	76 50	90.00	120.00
No. 5 Tees.....Each	11.00	13.00	17.50	26.00	34.00	51.00	60.00	80.00
No. 5 Tees, Reducing..Each	16.50	19.50	26.25	39.00	51.00	76.50	90.00	120.00
No. 3 Tees.....Each	8.25	9.75	13.25	19.50	25.50	38.00	45.00	60.00
No. 3 Tees, Reducing..Each	12.58	14.63	19.88	29.25	38.25	57.00	67.50	90.00
No. 4 Crosses.....Each		17.50	24.00	35.00	45.00	68.00	80.00	107.00
No. 4 Crosses, Reducing .....Each		26.25	36.00	52.50	67.50	102.00	120.00	160.50

Furnished Galvanized at double above list.

For Long Sweep Fittings with Flanged Ends, see Page 381.
For List of Sizes, see pages 699 to 701.
For Sprinkler Fittings for Fire Protection Service, see page 381.

AMERICAN STANDARD SPRINKLER FITTINGS

The Fittings shown on page 381 are designed in accordance with the rules and requirements of the National Fire Protection Association and are known as "American Standard Sprinkler Fittings." They are made in sizes 2½ to 6-inch, inclusive, in the various types shown.

Our regular Standard Cast Iron Screwed Fittings, sizes 2-inch and smaller, and our Standard Flanged Fittings, sizes 7-inch and larger, are acceptable to the National Fire Protection Association, and with the fittings shown on page 381 form a complete line of fittings for sprinkler service.

Screwed fittings, flanged fittings, and combination screwed and flanged fittings all have the same center to end dimensions for each respective size.

Reducing fittings are not made regularly with the reduced opening, less than one-half the nominal pipe size of the largest opening of the fitting.

When one end is flanged, the largest opening will be flanged unless otherwise specified.

Fittings are guaranteed for water working pressures up to 150 pounds and are marked CRANE W150 and CU; W denoting water and CU their suitability for fire protection service.

Tappings will be provided only for drain or test purposes, in which case fittings will be provided with bosses for tapping when required, if the location and size of tapping are specified. Fittings 2½ to 6-inch, inclusive, may be tapped ½-inch on the side without boss and fittings larger than 6-inch may be tapped ¾-inch without boss. Slip bosses having blind holes (bosses having drilled holes, but not tapped) will be provided when required to act as sockets for supports.

For list of sizes, see pages 696 to 698.

In describing Tees and Crosses the run is first named and then the outlet or outlets.

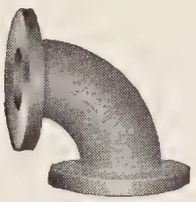
All Flanges and Drilling Templates are the "American Standard."

AMERICAN STANDARD
SPRINKLER FITTINGS
CAST IRON
FOR FIRE PROTECTION SERVICE
FOR WATER WORKING PRESSURES UP TO 150 POUNDS

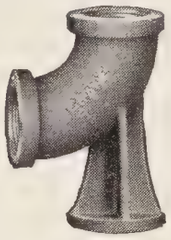
ELBOWS

STYLE A
CODE: HEMACHROME

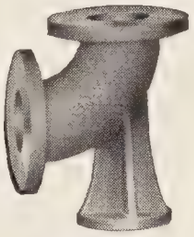
STYLE B
CODE: HEMATITIC



STYLE C
CODE: HEMDSMOUW



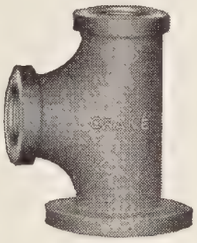
STYLE D
CODE: HEMIHEDRAL



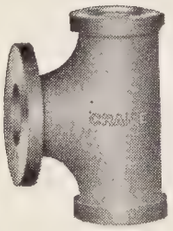
STYLE E
CODE: HEMIPAGIAM

TEES

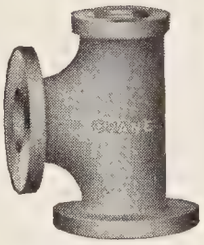
STYLE G
CODE: HEMMANTE



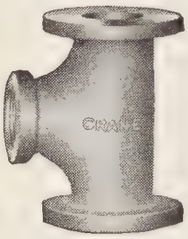
STYLE H
CODE: HERAUFHOB



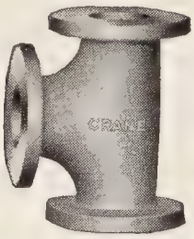
STYLE K
CODE: HERSEAUX



STYLE L
CODE: HEURAUFEN



STYLE M
CODE: HEXAPHILLO

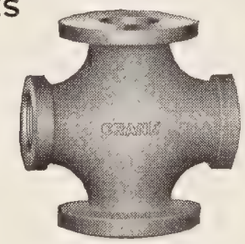


STYLE N
CODE: HEXENHAFT

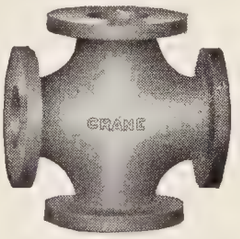
CROSSES

STYLE O
CODE: HIBERNALIS

STYLE P
CODE: HIBRIDARUM



STYLE R
CODE: HILLETJE



STYLE S
CODE: HIMIARITE

Size.....Inches	2½	3	3½	4	5	6
Size.....Millimeters	64	76	90	100	125	150
Style A, Elbows.....Each	1.20	2.25	3.25	3.50	6.50	8.75
Style B, Elbows.....Each	5.50	6.00	6.50	7.50	10.00	14.00
Style C, Elbows.....Each	6.75	7.50	8.50	10.00	12.50	17.50
Style D, Elbows.....Each		8.00		11.00	15.00	18.00
Style G, Tees.....Each	2.40	4.50	6.50	7.00	13.00	17.50
Style G, Tees, Reducing.....Each	3.60	6.75	9.75	10.50	19.50	26.25
Style H, Tees.....Each	9.00	10.00	11.00	12.00	15.00	22.00
Style K, Tees.....Each	9.00	10.00	11.00	12.00	15.00	22.00
Style L, Tees.....Each	9.00	10.00	11.00	12.00	15.00	22.00
Style M, Tees.....Each	9.00	10.00	11.00	12.00	15.00	22.00
Style N, Tees.....Each	10.00	11.50	13.00	15.00	18.00	26.00
Style O, Crosses.....Each	3.20	6.00	8.75	9.50	17.50	24.00
Style P, Crosses.....Each	12.50	13.50	15.00	17.00	22.00	30.00
Style R, Crosses.....Each	12.50	13.50	15.00	17.00	22.00	30.00
Style S, Crosses.....Each	13.50	15.00	17.00	20.00	25.00	35.00

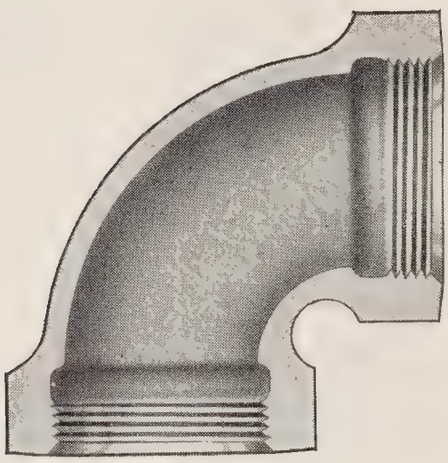
Style E Base Elbows are made to order only, price on application.
To figure Galvanized, double the above list prices.
The above prices include the facing and drilling of the flanges.
For list of sizes, see pages 696 to 698.
Sizes not listed above, prices on application.
Templates for drilling, page 596.

These Fittings are designed in accordance with the rules and requirements of the National Fire Protection Association and are marked "CU" to denote their use for fire protection service.

DRAINAGE FITTINGS

CAST IRON

SCREWED FOR WROUGHT PIPE



TO THE PLUMBING TRADE:

We have been manufacturing Drainage Fittings for many years, and have increased the number of sizes and shapes to keep pace with improvements in modern sanitary engineering.

DESIGN

These fittings are made with a shoulder, and are of the same inside diameter as wrought pipe.

COATING

When not otherwise specified, these Fittings will be coated with heated asphaltum excepting those for use in New York City, which will not be coated.

GALVANIZED DRAINAGE FITTINGS

We have exceptional facilities for furnishing Galvanized Drainage Fittings promptly.

MALLEABLE IRON DRAINAGE FITTINGS

We can furnish these fittings, made of malleable iron, from the cast iron patterns, and are prepared to fill orders in any quantity on short notice.

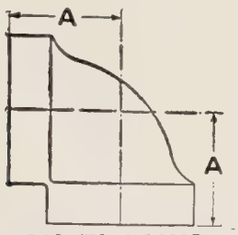
VACUUM CLEANING INSTALLATIONS

We recommend the use of our Drainage Fittings for Vacuum Cleaning installations. Fittings that are ordinarily tapped, pitched for drainage work, can be furnished, to order, without pitch.

ALL DRAINAGE FITTINGS ARE RECESSED TO ALLOW EASY ENTRANCE OF THE PIPE.

DRAINAGE FITTINGS

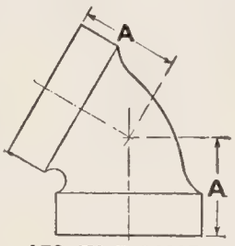
CAST IRON **SCREWED FOR WROUGHT PIPE**



90° ELBOWS
No. 1000
CODE: HINABGEHEN

No. 1000
REDUCING SIZES

Size.....Inches	1½x1¼	2x1¼
Size.Millimeters	38x32	50x32
Each.....	.57	.85
Galv.....Each	1.00	1.50

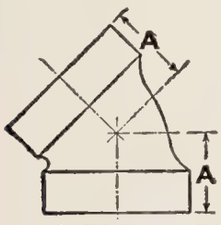


45° ELBOWS
No. 1003
CODE: HINNIBILEM

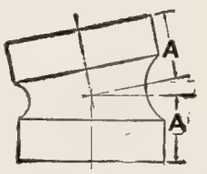
Size.....Inches	1¼	1½	2	2½	3	4	5
Size.....Millimeters	32	38	50	64	76	100	125
Dim. A, No. 1000.....Inches	1¾	2 3/16	2⅜	2 13/16	3 3/16	3 13/16	4½
Dim. A, No. 1003.....Inches	1⅜	1 7/16	1¾	2 1/16	2⅜	2¾	3 3/16
Price.....Each	.30	.38	.57	1.20	1.45	2.30	4.25
Price, Galvanized.....Each	.52	.67	1.00	2.10	2.55	4.00	7.40

Size.....Inches	6	7	8	10	12	14
Size.....Millimeters	150	175	200	250	300	350
Diameter A, No. 1000.....Inches	5 3/16	5 13/16	6½	7¾	9	9¾
Diameter A, No. 1003.....Inches	3½	3⅞	4 3/16	4⅞	5½	5⅞
Price.....Each	6.25	11.50	15.00	31.00	47.50	65.00
Price, Galvanized.....Each	11.00	20.00	26.25	54.00	83.00	114.00

The 90° Elbows are tapped, pitched ¼-inch to the foot.

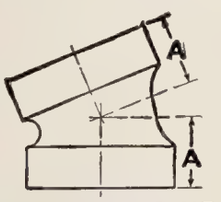


60° ELBOWS
No. 1002
CODE: HINSTURMEN



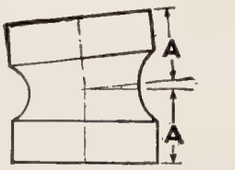
11¼° ELBOWS
No. 1006
CODE: HINTERRUCK

Size.....Inches	1¼	1½	2	2½	3	4	5	6	7	8	10
Size.....Millimeters	32	38	50	64	76	100	125	150	175	200	250
Dim. A, No. 1002.In.	1 9/16	1¾	2	2½	2⅞	3⅜	3⅞	4 3/16	4½	5⅜	6¼
Dim. A, No. 1006.In.	1	1 7/32	1 13/32	1 21/32	1 13/16	2⅛	2⅜	2½	2⅝	2¾	3
Price.....Each	.30	.38	.57	1.20	1.45	2.30	4.25	6.25	11.50	15.00	31.00
Price, Galv.....Each	.52	.67	1.00	2.10	2.55	4.00	7.40	11.00	20.00	26.25	54.00



22½° ELBOWS
No. 1005
CODE: HINWEGNAHM

22½° ELBOWS



5⅝° ELBOWS
No. 1007
CODE: HIPPACAVIT

Size.....Inches	1¼	1½	2	2½	3	4	5	6	7	8	10	12
Size..Millimeters	32	38	50	64	76	100	125	150	175	200	250	300
Dim. A...Inches	1⅛	1¼	1 7/16	1¾	2	2 5/16	2⅝	2 15/16	3¼	3 9/16	3⅞	4 3/16
Price.....Each	.30	.38	.57	1.20	1.45	2.30	4.25	6.25	11.50	15.00	31.00	47.50
Price, Galv.Each	.52	.67	1.00	2.10	2.55	4.00	7.40	11.00	20.00	26.25	54.00	83.00

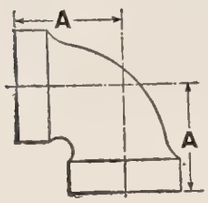
5⅝° ELBOWS

Size.....Inches	1¼	1½	2	3	4	5	6	7	8	10
Size.....Millimeters	32	38	50	76	100	125	150	175	200	250
Dimensions A.....Inches	1	1 5/16	1½	1¾	2	2¼	2 5/16	2⅜	2½	2¾
Price.....Each	.30	.38	.57	1.45	2.30	4.25	6.25	11.50	15.00	31.00
Price, Galvanized....Each	.52	.67	1.00	2.55	4.00	7.40	11.00	20.00	26.25	54.00

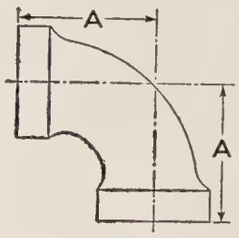
DIMENSIONS SUBJECT TO A SLIGHT VARIATION AND CHANGE WITHOUT NOTICE

DRAINAGE FITTINGS

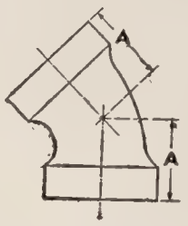
CAST IRON — SCREWED FOR WROUGHT IRON



90° LONG TURN ELBOWS
No. 1001
CODE: HIPPORHINE



90° EXTRA LONG TURN ELBOWS No. 1001½
CODE: HIVERNERA



45° LONG TURN ELBOWS
No. 1004
CODE: HOBACHONA

90° LONG TURN ELBOWS

Size	Inches	1¼	1½	2	2½	3	4	5
Size	Millimeters	32	38	50	64	76	100	125
Dimension A	Inches	2 1/4	2 1/2	3 1/16	3 11/16	4 1/4	5 3/16	6 1/8
Price	Each	.35	.42	.65	1.40	1.75	2.75	5.25
Price, Galvanized	Each	.60	.72	1.15	2.45	3.10	4.80	9.20
Size	Inches	6	7	8	10	12	14	
Size	Millimeters	150	175	200	250	300	350	
Dimension A	Inches	7 1/8	8 1/8	9	11	13	14 1/4	
Price	Each	7.50	13.50	19.00	38.00	57.50	75.00	
Price, Galvanized	Each	13.15	23.50	33.25	66.50	100.00	130.00	

The 90° Long Turn Elbows are tapped, pitched ¼-inch to the foot.

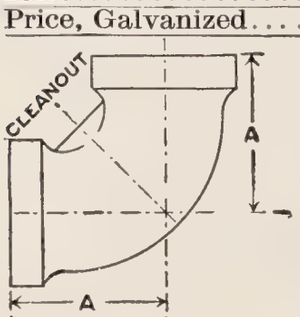
90° EXTRA LONG TURN ELBOWS

Size	Inches	1¼	1½	2
Size	Millimeters	32	38	50
Dimension A		3	3½	4
Price	Each	.35	.42	.65
Price, Galvanized	Each	.60	.72	1.15

The 90° Extra Long Turn Elbows are tapped, pitched ¼-inch to the foot.

45° LONG TURN ELBOWS

Size	Inches	1¼	1½	2	2½	3	4	5
Size	Millimeters	32	38	50	64	76	100	125
Dimension A	Inches	1 3/4	1 7/8	2 1/4	2 5/8	2 7/8	3 7/16	4 1/8
Price	Each	.35	.42	.65	1.40	1.75	2.75	5.25
Price, Galvanized	Each	.60	.72	1.15	2.45	3.10	4.80	9.20
Size	Inches	6	7	8	10	12	14	
Size	Millimeters	150	175	200	250	300	350	
Dimension A	Inches	4 7/8	5 1/2	6	7 1/2	8 3/4	9 1/2	
Price	Each	7.50	13.50	19.00	38.00	57.50	75.00	
Price, Galvanized	Each	13.15	23.50	33.25	66.50	100.00	130.00	

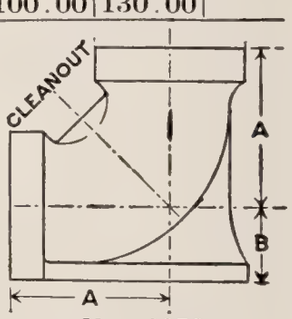


No. 1047
WITHOUT BASE
CODE: HOCHACHTEN

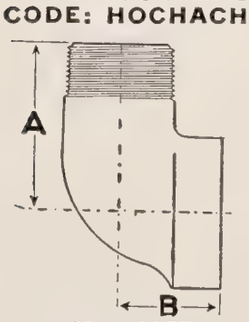
90° LONG TURN ELBOWS WITH CLEANOUT

Size	Inches	4
Size	Millimeters	100
Dimension A	Inches	6 1/4
Dimension B	Inches	2 7/8
Size of Cleanout	Inches	2
No. 1047	Each	5.00
No. 1047, Galvanized	Each	8.75
No. 1056	Each	7.00
No. 1056, Galvanized	Each	12.25

The No. 1047 and 1056 Elbows are tapped, pitched ¼-inch to the foot.



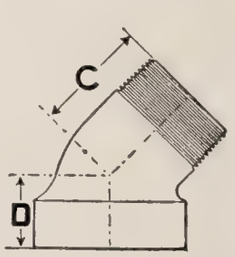
No. 1056
WITH BASE
CODE: HOCHBERUF



No. 1057
90° STREET ELBOW
CODE: HOCHEBENE

STREET ELBOWS

Size	Inches	1¼	1½	2
Size	Millimeters	32	38	50
Dimension A	Inches	2 5/8	2 15/16	3 5/16
Dimension B	Inches	1 5/8	1 13/16	2 1/8
Dimension C	Inches	1 7/8	2	2 7/16
Dimension D	Inches	1 3/16	1 1/4	1 3/4
Price	Each	.35	.40	.60
Price, Galvanized	Each	.60	.70	1.10

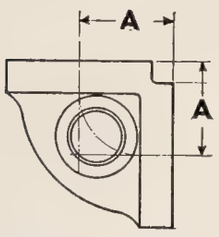


No. 1058
45° STREET ELBOW
CODE: HOFBAUAMT

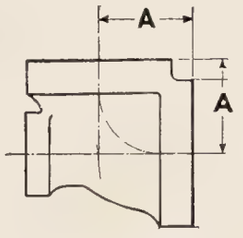
DIMENSIONS SUBJECT TO A SLIGHT VARIATION AND CHANGE WITHOUT NOTICE.

DRAINAGE FITTINGS

CAST IRON — SCREWED FOR WROUGHT PIPE



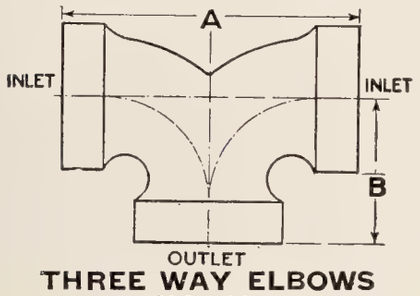
90° ELBOWS
WITH SIDE OUTLET
NO. 1008
CODE: HOFBRAUCH



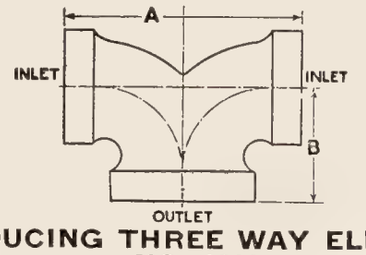
90° ELBOWS
WITH HEEL OUTLET
NO. 1009
CODE: HOFCHAISE

Size	Inches	4
Size	Millimeters	100
Dimension A	Inches	3 13/16
Size of Side Outlet	Inches	2
Size of Side Outlet	Millimeters	50
Size of Heel Outlet	Inches	2
Size of Heel Outlet	Millimeters	50
Price	Each	3.85
Price, Galvanized	Each	6.75

The above fittings are tapped, pitched ¼-inch to the foot.



THREE WAY ELBOWS
NO. 1010
CODE: HOFRATIN



REDUCING THREE WAY ELBOWS
NO. 1011
CODE: HOFSONNE

Size	Inches	1¼	1½	2	2½	3	4
Size	Millimeters	32	38	50	64	76	100
Dimension A	Inches	4½	5¼	6¼	7⅜	8⅝	10⅜
Dimension B	Inches	2¼	2⅝	3⅛	3 11/16	4 5/16	5 3/16
Price	Each	.75	.85	1.10	2.25	3.00	5.00
Price, Galvanized	Each	1.25	1.50	1.95	3.90	5.25	8.75
Size	Inches	4x3	5	5x4	6	6x4	6x5
Size	Millimeters	100x76	125	125x100	150	150x100	150x125
Dimension A	Inches	9½	12¼	11⅜	14¼	12⅜	13⅜
Dimension B	Inches	4 5/16	6⅛	5 5/16	7⅛	5 7/16	6¼
Price	Each	5.50	7.50	8.25	13.50	15.00	15.00
Price, Galvanized	Each	9.65	13.15	14.50	23.50	26.25	26.25

The inlets of Three Way Elbows are tapped, pitched ¼-inch to the foot.
The inlets on Reducing Fittings are always the smallest openings.

DIMENSIONS SUBJECT TO A SLIGHT VARIATION AND CHANGE WITHOUT NOTICE

DRAINAGE FITTINGS

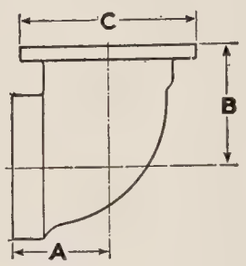
CAST IRON — SCREWED FOR WROUGHT PIPE

CLOSET ELBOWS

FLANGED ONE END

Size	Inches	4
Size	Millimeters	100
Dimension A	Inches	$3\frac{13}{16}$
Dimension B	Inches	$4\frac{5}{8}$
Diameter of Flange C	Inches	7
Price	Each	4.25
Price, Galvanized	Each	7.40

NO. 1012

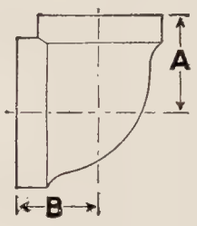


CODE: HOFTHOREN

REDUCING CLOSET ELBOWS

Size	Inches	4x5
Size	Millimeters	100x125
Dimension A	Inches	$4\frac{7}{16}$
Dimension B	Inches	$3\frac{13}{16}$
Price	Each	4.25
Price, Galvanized	Each	7.40

NO. 1013

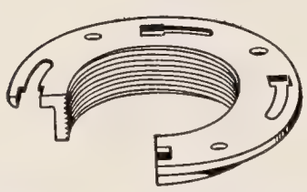


CODE: HOFWACHTER

Closet Elbows are tapped pitched ¼-inch to the foot.

CLOSET FLANGES

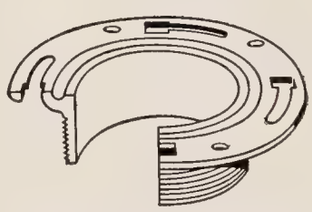
FOR FLAT GASKET



NO. 1014 MALL. IRON
CODE: HOFWUNDE

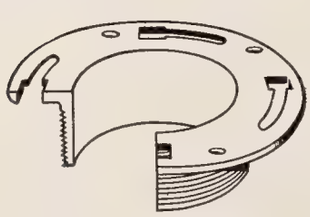
NO. 1014½ BRASS
CODE: HOGERLING

FOR RING GASKET



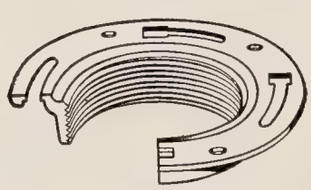
NO. 1015½ BRASS
CODE: HOGNERONT

FOR FLAT GASKET



No. 1015 BRASS
CODE: HOGNANTE

FOR RING GASKET



NO. 1016 MALL. IRON
CODE: HOHLUNDER

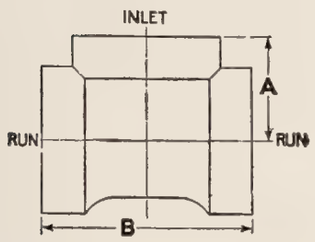
NO. 1016½ BRASS
CODE: HOHLZAHNE

Size	Inches	4
Size	Millimeters	100
Diameter of Flange	Inches	7
Price, Nos. 1014, 1016, Malleable Iron	Each	1.35
Price, Nos. 1014, 1016, Malleable Iron, Galvanized	Each	2.35
Price, Nos. 1014½, 1015, 1015½, 1016½, Brass	Each	7.00

DIMENSIONS SUBJECT TO A SLIGHT VARIATION AND CHANGE WITHOUT NOTICE

DRAINAGE FITTINGS

CAST IRON **SCREWED FOR WROUGHT PIPE**



TEES

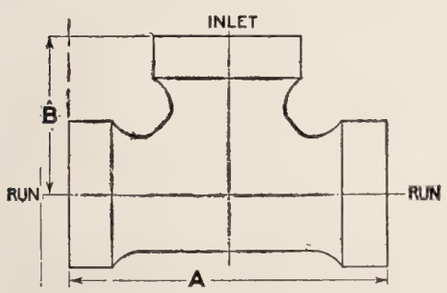
NO. 1017

CODE: HOHNECKTE

Size.....Inches	1¼	1½	1½x1¼	2	2x1¼	2x1½	2½	2½x2	3	3x1½
Size.Millimeters	32	38	38x32	50	50x32	50x38	64	64x50	76	76x38
Dim. A...Inches	1¾	2 3/16	2 5/16	2 5/16		2¼	2 13/16		3 3/16	
Dim. B...Inches	3½	4 3/8	4 5/8	4 5/8		4 1/8	5 5/8		6 3/8	
Price.....Each	.45	.55	.60	.80	.90	.90	1.50	1.65	2.00	2.20
Price, Galv Each	.80	1.00	1.10	1.40	1.60	1.60	2.50	2.75	3.50	3.85

Size....Inches	3x2	4	4x2	4x3	5	5x2	5x3	5x4	6	7
Size.....Mm.	76x50	100	100x50	100x76	125	125x50	125x76	125x100	150	175
Dim. A.Inches	3	4	3 9/16	3¾	4 5/8	4 3/16	4 3/8		5 7/16	5 13/16
Dim. B.Inches	5½	8	6	7	9¼	6	6 7/8		10 3/8	11 5/8
Price.....Each	2.20	3.25	3.60	3.60	6.00	6.60	6.60	6.60	8.75	16.00
Price,Galv.Ea.	3.85	5.70	6.30	6.30	10.50	11.55	11.55	11.55	15.25	28.00

Size.....Inches	8	10	12	12x8	12x10	14x8	14x10	14x12
Size....Millimeters	200	250	300	300x200	300x250	350x200	350x250	350x300
Dimension A Inches	6½	7¾	9					
Dimension B Inches	13	15½	18					
Price.....Each	21.00	43.00	60.00	65.00	65.00	85.00	85.00	85.00
Price, Galv...Each	37.00	75.00	100.00	110.00	110.00	145.00	145.00	145.00



BASIN TEES

NO. 1018

CODE: HOLGABAS

Size.....Inches	1¼	1½	1½x1¼	2	2x1¼	2x1½	2½
Size.....Millimeters	32	38	38x32	50	50x32	50x38	64
Dimension A.....Inches	4 5/8	5 3/8	5 1/8	7	6¼	6½	8½
Dimension B.....Inches	2 5/16	2 11/16	2 9/16	3½	3⅛	3¼	4¼
Price.....Each	.60	.70	.77	1.10	1.20	1.20	1.75
Price, Galvanized.....Each	1.00	1.22	1.35	1.95	2.10	2.10	3.00

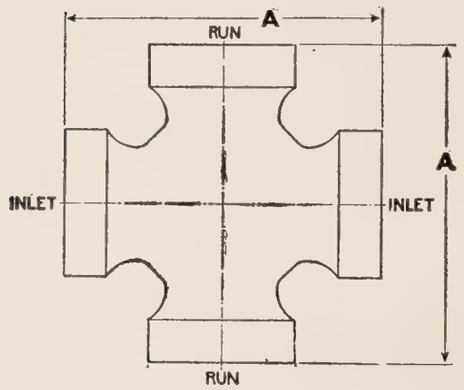
The inlets of Tees and Basin Tees are tapped, pitched ¼-inch to the foot.

The inlets on Reducing Fittings are always the smallest openings.

DIMENSIONS SUBJECT TO A SLIGHT VARIATION AND CHANGE WITHOUT NOTICE

DRAINAGE FITTINGS

CAST IRON — SCREWED FOR WROUGHT PIPE



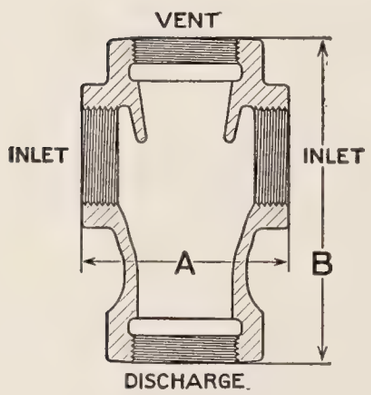
BASIN CROSSES

NO. 1019

CODE: HONIGGABEL

Size.....Inches	1¼	1½	2	2x1½
Size.....Millimeters	32	38	50	50x38
Dimension A.....Inches	4⅝	5⅜	7	6½
Price.....Each	1.25	1.50	1.75	1.95
Price, Galvanized.....Each	2.25	2.50	3.10	3.40

The inlets of Basin Crosses are tapped, pitched ¼-inch to the foot.



PARTITION CROSSES

No. 1046

CODE: HONIGLEUTE

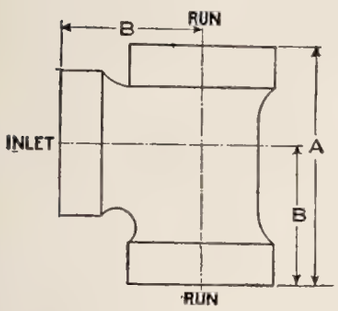
Size.....Inches	1½x1¼
Size.....Millimeters	38x32
Dimension A.....Inches	3½
Dimension B.....Inches	5½
Price.....Each	1.25
Price, Galvanized.....Each	2.20

Partition Crosses have been made to supply a demand in certain localities, but may not be passed by inspectors everywhere.

The inlets on Reducing Fittings are always the smallest openings.

DRAINAGE FITTINGS

CAST IRON **SCREWED FOR WROUGHT PIPE**



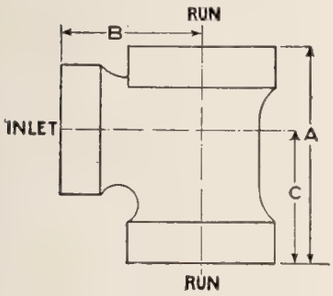
90° Y BRANCHES

NO. 1020

TEE PATTERN

CODE: HONIGMUND

Size.....Inches	1	1¼	1½	2	2½	3	4	5	6	7	8	10	12
Size.....Millimeters	25	32	38	50	64	76	100	125	150	175	200	250	300
Dimension A....Inches	3¼	3¾	4¼	5 3/16	6 5/16	7¼	8¾	10 5/16	11 15/16	13 5/8	15 1/16	20	24¼
Dimension B....Inches	1 15/16	2¼	2½	3 1/16	3 11/16	4¼	5 3/16	6⅛	7⅛	8⅛	9	11⅜	13¾
Price.....Each	.40	.45	.57	.85	1.80	2.20	3.50	6.50	9.50	17.50	23.00	47.00	70.00
Price, Galvanized.Each	.70	.80	1.00	1.50	3.15	3.85	6.15	11.35	16.50	30.50	40.00	82.00	124.00



REDUCING 90° Y BRANCHES

NO. 1021

TEE PATTERN

CODE: HONKENEJA

Size.....Inches	1¼x1	1½x1	1½x1¼	2x1¼	2x1½	2½x1¼	2½x1½	2½x2
Size.....Millimeters	32x25	38x25	38x32	50x32	50x38	64x32	64x38	64x50
Dimension A.Inches			3 7/8		4 5/8		4 7/8	5½
Dimension B.Inches			2½		2 15/16		3 1/16	3 5/16
Dimension C.Inches			2 3/8		2 11/16		2 13/16	3¼
Price.....Each	.50	.63	.63	.95	.95	2.00	2.00	2.00
Price, Galv....Each	.90	1.10	1.10	1.65	1.65	3.50	3.50	3.50

Size.....Inches	3x1¼	3x1½	3x2	4x1¼	4x1½	4x2	4x2½	4x3
Size.....Millimeters	76x32	76x38	76x50	100x32	100x38	100x50	100x64	100x75
Dimension A.Inches		5 1/16	5 11/16		5¼	5 13/16	6 5/8	7 3/8
Dimension B.Inches		3 5/16	3 5/8		3 13/16	4 1/16	4 7/16	4¾
Dimension C.Inches		2 15/16	3 5/16		3	3 3/8	3 13/16	4 5/16
Price.....Each	2.40	2.40	2.40	3.85	3.85	3.85	3.85	3.85
Price, Galv....Each	4.20	4.20	4.20	6.75	6.75	6.75	6.75	6.75

Size.....Inches	3x4	5x1½	5x2	5x2½	5x3	5x4	6x1½	6x2
Size.....Millimeters	76x100	125x38	125x50	125x64	125x75	125x100	150x38	150x50
Dimension A.Inches	8 5/8	5 9/16	6⅛		7¾	9⅛		6¼
Dimension B.Inches	5 3/16	4 3/8	4 5/8		5¼	5 11/16		5⅛
Dimension C.Inches	5⅛	3 3/16	3 9/16		4½	5 3/8		3 5/8
Price.....Each	3.85	7.15	7.15	7.15	7.15	7.15	10.50	10.50
Price, Galv.....Each	6.75	12.50	12.50	12.50	12.50	12.50	18.50	18.50

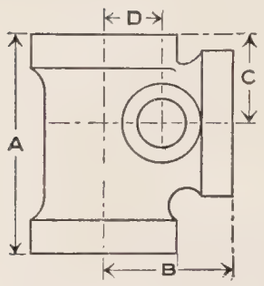
Size.....Inches	6x3	6x4	6x5	8x2	8x3	8x4	8x5	8x6
Size.....Millimeters	150x76	150x100	150x125	200x50	200x76	200x100	200x125	200x150
Dimension A.Inches	7 7/8	9¼	10 9/16		11 7/16	11 7/16		15 1/16
Dimension B.Inches	5¾	6 3/16	6 5/8		7¼	7 9/16		8 5/16
Dimension C.Inches	4 9/16	5 7/16	6¼		7 15/16	7½		9 5/8
Price.....Each	10.50	10.50	10.50	25.50	25.50	25.50	25.50	25.50
Price, Galv....Each	18.50	18.50	18.50	44.50	44.50	44.50	44.50	44.50

The inlet of 90° Y Branches is tapped, pitched ¼-inch to the foot.

DIMENSIONS SUBJECT TO A SLIGHT VARIATION AND CHANGE WITHOUT NOTICE

DRAINAGE FITTINGS

CAST IRON — SCREWED FOR WROUGHT PIPE

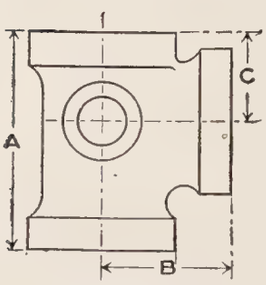


NO. 1050
CODE: HOOGBLAUW

90° Y BRANCHES WITH VENTS

(CLOSET TEES)

Size	Inches	4
Size	Millimeters	100
Dimension A	Inches	8¾
Dimension B	Inches	5 3/16
Dimension C	Inches	3 9/16
Dimension D	Inches	2 5/16
No. 1050, with 2-inch Vent on Branch, on Right Side	Each	5.75
No. 1050, with 2-inch Vent on Branch, on Right Side, Galv	Each	10.00
No. 1051, with 2-inch Vent on Branch, on Left Side	Each	5.75
No. 1051, with 2-inch Vent on Branch, on Left Side, Galv	Each	10.00

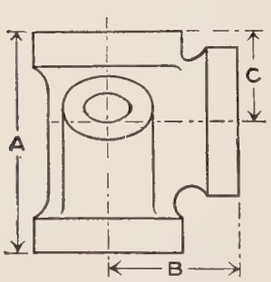


NO. 1052
CODE: HOOGLANDEN

90° Y BRANCHES WITH AUXILIARY INLETS

(CLOSET TEES)

Size	Inches	4
Size	Millimeters	100
Dimension A	Inches	8¾
Dimension B	Inches	5 3/16
Dimension C	Inches	3 9/16
No. 1052, with 2-inch Inlet on Body, on Right Side	Each	5.75
No. 1052, with 2-inch Inlet on Body, on Right Side, Galv	Each	10.00
No. 1053, with 2-inch Inlet on Body, on Left Side	Each	5.75
No. 1053, with 2-inch Inlet on Body, on Left Side, Galv	Each	10.00



NO. 1054
CODE: HORLOGEKAS

90° Y BRANCHES WITH AUXILIARY INLETS

(CLOSET TEES)

Size	Inches	4
Size	Millimeters	100
Dimension A	Inches	8¾
Dimension B	Inches	5 3/16
Dimension C	Inches	3 9/16
No. 1054, with 2-inch 45° Inlet on Body, on Right Side	Each	6.35
No. 1054, with 2-inch 45° Inlet on Body, on Right Side, Galv	Each	11.00
No. 1055, with 2-inch 45° Inlet on Body, on Left Side	Each	6.35
No. 1055, with 2-inch 45° Inlet on Body, on Left Side, Galv	Each	11.00

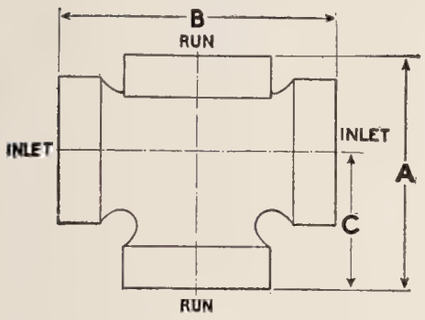
The 4-inch inlets on all above fittings are tapped, pitched ¼-inch to the foot.

DIMENSIONS SUBJECT TO A SLIGHT VARIATION AND CHANGE WITHOUT NOTICE

ABOVE CUTS SHOW RIGHT HAND INLETS

DRAINAGE FITTINGS

CAST IRON **SCREWED FOR WROUGHT PIPE**



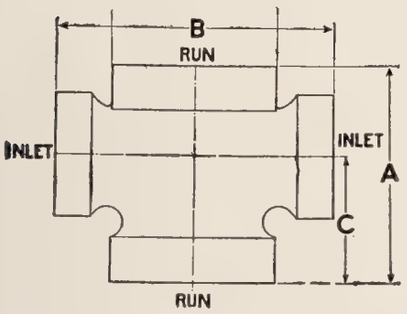
DOUBLE 90° Y BRANCHES

NO. 1024

TEE PATTERN

CODE: HORMINUM

Size.....Inches	1	1¼	1½	2	2½	3	4	5	6	7	8	10
Size.Millimeters	25	32	38	50	64	76	100	125	150	175	200	250
Dim. A...Inches	3¼	3¾	4¼	5 3/16	6 5/16	7¼	8¾	10 5/16	11 15/16	13 5/8	15 1/16	20
Dim. B...Inches	3 7/8	4½	5	6⅛	7 3/8	8½	10 3/8	12¼	14¼	16¼	18	22¾
Dim. C...Inches	1 15/16	2¼	2½	3 1/16	3 11/16	4¼	5 3/16	6⅛	7⅛	8⅛	9	11⅜
Price.....Each	.60	.70	.85	1.30	2.85	3.40	5.25	9.50	14.00	25.00	36.00	60.00
Price,Galv Each	1.05	1.22	1.50	2.30	5.00	5.95	9.20	16.50	24.50	42.50	62.00	102.00



DOUBLE REDUCING 90° Y BRANCHES

NO. 1025

TEE PATTERN

CODE: HORNDUMM

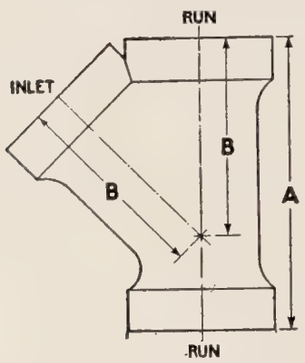
Size.....Inches	1¼x1	1½x1¼	2x1¼	2x1½	2½x1½	2½x2	3x1½	3x2
Size.....Millimeters	32x25	38x32	50x32	50x38	64x38	64x50	76x38	76x50
Dimension A..Inches		3 7/8		4 5/8		5½	5 1/16	5 11/16
Dimension B..Inches		5		5 7/8		6 5/8	6 5/8	7¼
Dimension C..Inches		2 3/8		2 11/16		3¼	2 15/16	3 5/16
Price.....Each	.77	.95	1.50	1.50	3.15	3.15	3.75	3.75
Price, Galv....Each	1.35	1.65	2.60	2.60	5.50	5.50	6.55	6.55

Size.....Inches	4x2	5x3	5x4	6x2	6x4	6x5	8x6
Size.....Millimeters	100x50	125x76	125x100	150x50	150x100	150x125	200x150
Dimension A....Inches	5 13/16	7¾	9⅛	6¼	9¼	10 9/16	15 1/16
Dimension B....Inches	8⅛	10½	11 3/8	10¼	12 3/8	13¼	16 5/8
Dimension C....Inches	3 3/8	4½	5 3/8	3 5/8	5 7/16	6¼	9 5/8
Price.....Each	5.75	10.50	10.50	15.50	15.50	15.50	40.00
Price, Galv.....Each	10.00	18.50	18.50	27.00	27.00	27.00	68.00

The inlets of Double 90° Y Branches are tapped, pitched ¼-inch to the foot. The inlets on Reducing Fittings are always the smallest openings.

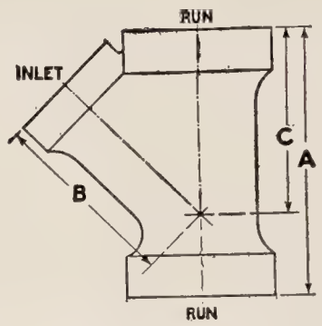
DRAINAGE FITTINGS

CAST IRON



45° Y BRANCHES
No. 1028
CODE: HORNLOFFEL

SCREWED FOR WROUGHT PIPE



REDUCING 45° Y BRANCHES
No. 1029
CODE: HORNSTRAHL

45° Y BRANCHES

Size.....Inches	1¼	1½	2	2½	3	4	5	6	7	8	10	12	14
Size.....Millimeters	32	38	50	64	76	100	125	150	175	200	250	300	350
Dimension A ...Inches	5	5½	6 7/16	7 7/8	9	10 7/8	12 15/16	14¾	16 11/16	18 13/16	20	24¼	28
Dimension B ...Inches	3¼	3 5/8	4 5/16	5 3/8	6 3/16	7 11/16	9 3/16	10¾	12¼	13 9/16	16⅛	19 5/8	21½
Price.....Each	.52	.65	.95	2.10	2.65	3.85	7.10	10.50	19.00	25.00	52.00	75.00	95.00
Price, Galvanized.Each	.90	1.15	1.65	3.70	4.65	6.75	12.50	18.50	33.25	44.00	91.00	130.00	165.00

REDUCING 45° Y BRANCHES

Size.....Inches	1½x1¼	2x1¼	2x1½	2½x1¼	2½x1½	2½x2	3x1¼	3x1½	3x2	3x2½
Size.....Millimeters	38x32	50x32	50x38	64x32	64x38	64x50	76x32	76x38	76x50	76x64
Dimension A ...Inches			5 7/8		6 7/16	7 1/16		6 5/8	7 3/8	8
Dimension B ...Inches			4⅛		4 5/8	5⅛		5 1/16	5 3/8	5 13/16
Dimension C ...Inches			4 1/16		4 9/16	4 15/16		4 15/16	5 5/16	5 11/16
Price.....Each	.72	1.05	1.05	2.30	2.30	2.30	2.90	2.90	2.90	2.90
Price, Galvanized.Each	1.25	1.85	1.85	4.00	4.00	4.00	5.10	5.10	5.10	5.10

Size.....Inches	4x1¼	4x1½	4x2	4x2½	4x3	5x2	5x3	5x4	6x2	6x2½
Size.....Millimeters	100x32	100x38	100x50	100x64	100x76	125x50	125x76	125x100	150x50	150x64
Dimension A ..Inches		7 3/16	7 11/16		9¼	8¼	9 13/16	11 3/8	8 7/16	
Dimension B ...Inches		6 1/16	6 5/16		7 3/16	7 3/16	7 7/8	8½	8 1/16	
Dimension C ...Inches		5¾	6		6 7/8	6 7/8	7 5/8	8 7/16	7 9/16	
Price.....Each	4.25	4.25	4.25	4.25	4.25	7.80	7.80	7.80	11.50	11.50
Price, Galvanized.Each	7.40	7.40	7.40	7.40	7.40	13.65	13.65	13.65	20.00	20.00

Size.....Inches	6x3	6x4	6x5	7x3	7x4	7x5	7x6	8x3	8x4	8x5
Size.....Millimeters	150x76	150x100	150x125	175x76	175x100	175x125	175x150	200x76	200x100	200x125
Dimension A ...Inches	10	11 7/8	13	10	11 7/16	16 11/16	16 11/16		11 7/16	
Dimension B ...Inches	8¾	9 3/8	10	9 5/8	10¼	10 15/16	11 9/16		11	
Dimension C ...Inches	8 5/16	9 1/16	9 13/16	8 7/8	9 11/16	10½	11 3/8		10 7/16	
Price.....Each	11.50	11.50	11.50	21.00	21.00	21.00	21.00	27.50	27.50	27.50
Price, Galvanized.Each	20.00	20.00	20.00	37.00	37.00	37.00	37.00	48.00	48.00	48.00

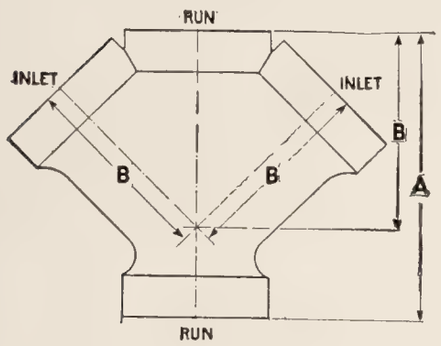
Size.....Inches	8x6	10x4	10x5	10x6	12x6	14x3	14x4	14x5	14x6	14x12
Size.....Millimeters	200x150	250x100	250x125	250x150	300x150	350x76	350x100	350x125	350x150	350x300
Dimension A ...Inches	14 15/16	14		15½	18				19½	
Dimension B ...Inches	12 3/8	12 7/8		14¼	15¾				17¾	
Dimension C ...Inches	11 7/8	11½		13½	14¼				16 3/8	
Price.....Each	27.50	57.00	57.00	57.00	80.00	105.00	105.00	105.00	105.00	105.00
Price, Galvanized.Each	48.00	97.00	97.00	97.00	140.00	175.00	175.00	175.00	175.00	175.00

The inlets on Reducing Fittings are always the smallest openings.

DIMENSIONS SUBJECT TO A SLIGHT VARIATION AND CHANGE WITHOUT NOTICE

DRAINAGE FITTINGS

CAST IRON **SCREWED FOR WROUGHT PIPE**

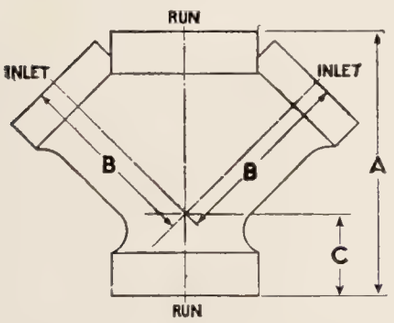


45° DOUBLE Y BRANCHES

NO. 1030

CODE: HOSTILIBUS

Size.....Inches	1¼	1½	2	2½	3	4	5	6	7	8	10
Size.Millimeters	32	38	50	64	76	100	125	150	175	200	250
Dimension A.In.	5	5½	6 7/16	7 7/8	9	10 7/8	12 15/16	14 3/4	16 11/16	18 13/16	20
Dimension B In.	3¼	3 5/8	4 5/16	5 3/8	6 3/16	7 11/16	9 3/16	10 3/4	12¼	13 9/16	16 1/8
Price.....Each	.90	1.00	1.45	3.25	4.00	5.75	10.75	16.00	28.50	38.00	78.00
Price Galv.Each	1.60	1.75	2.55	5.70	7.00	10.00	18.80	28.00	50.00	66.50	137.00



REDUCING 45° DOUBLE Y BRANCHES

NO. 1031

CODE: HOUGUETTE

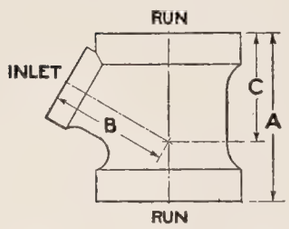
Size.....Inches	1½x1¼	2x1½	2½x1¼	2½x1½	3x1½	3x2	4x2	4x3	5x2
Size.....Millimeters	38x32	50x38	64x32	64x38	76x38	76x50	100x50	100x76	125x50
Dimension A.....In.		5 7/8		6 7/16	6 5/8	7 3/8	7 11/16	9¼	8¼
Dimension B.....In.		4 1/8		4 5/8	5 1/16	5 3/8	6 5/16	7 3/16	7 3/16
Dimension C.....In.		4 1/16		4 9/16	4 15/16	5 5/16	6	6 7/8	6 7/8
Price.....Each	1.10	1.60	3.60	3.60	4.40	4.40	6.35	6.35	11.75
Price, Galv.....Each	1.90	2.80	6.30	6.30	7.70	7.70	11.00	11.00	20.50

Size.....Inches	5x3	5x4	6x2	6x3	6x4	7x6	8x4	8x6
Size..Millimeters	125x76	125x100	150x50	150x76	150x100	175x150	200x100	200x150
Dimension A..In.	9 13/16	11 3/8	8 7/16		11 7/8		11 7/16	14 15/16
Dimension B..In.	7 7/8	8½	8 1/16		9 3/8		11	12 3/8
Dimension C..In.	7 5/8	8 7/16	7 9/16		9 1/16		10 7/16	11 7/8
Price.....Each	11.75	11.75	17.50	17.50	17.50	31.50	42.00	42.00
Price Galv..Each	20.50	20.50	30.50	30.50	30.50	54.00	72.00	72.00

The inlets on Reducing Fittings are always the smallest openings.

DRAINAGE FITTINGS

CAST IRON — **SCREWED FOR WROUGHT PIPE**



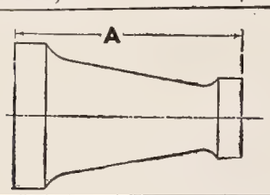
60° Y BRANCHES

NO. 1032

CODE: HUDELBUBE

Size.....Inches	1½x1½	2x2	2x1½	3x2	4x4	4x2	4x3	5x5	5x2
SizeMillimeters	38x38	50x50	50x38	76x50	100x100	100x50	100x76	125x125	125x50
Dim. A..Inches	4 5/8	5 1/2	4 15/16	6 7/16	9 3/8	6 11/16		11 1/8	
Dim. B..Inches	2 5/8	3 1/4	3 1/16	4 1/8	5 3/4	4 3/4		6 3/4	
Dim. C..Inches	2 5/8	3 1/4	2 15/16	3 15/16	5 3/4	4 5/16		6 3/4	
Price.....Each	.65	.95	1.05	2.90	3.85	4.25	4.25	7.10	7.80
Price,Galv..Ea.	1.15	1.65	1.85	5.10	6.75	7.40	7.40	12.50	13.65

Size.....Inches	5x3	5x4	6x6	6x2	6x4	6x5	8x4	8x6
Size.Millimeters	125x76	125x100	150x150	150x50	150x100	150x125	200x100	200x150
Dim. A...Inches	8 1/2		13				11 7/16	
Dim. B...Inches	6		7 7/8				8 9/16	
Dim. C...Inches	5 9/16		7 7/8				7 3/8	
Price.....Each	7.80	7.80	10.50	11.50	11.50	11.50	27.50	27.50
Price,Galv Each	13.65	13.65	18.50	20.00	20.00	20.00	48.00	48.00



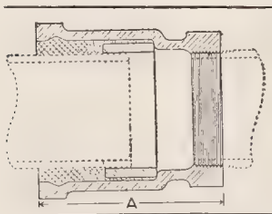
INCREASERS

NO. 1033

CODE: HUGELAUF

Size..... Inches	2x1½	2½x2	3x2	4x2	4x3	5x2	5x3	5x4	6x4	6x5
Size.....Millimeters	50x38	64x50	76x50	100x50	100x76	125x50	125x76	125x100	150x100	150x125
Dim. A.....Inches	9	9	9	9	9	9	9	9	9	9
Price.....Each	1.75	2.00	2.50	3.75	3.75	5.50	5.50	5.50	6.50	6.50
Price, Galv..... Each	3.00	3.50	4.40	6.55	6.55	9 65	9.65	9.65	11.35	11.35

Size..... Inches	7x4	7x6	8x4	8x6	10x8	12x10	14x6	14x8	14x12	
Size.....Millimeters	175x100	175x150	200x100	200x150	250x200	300x250	350x150	350x200	350x300	
Dim. A.....Inches			9	9						
Price.....Each	12.00	12.00	15.00	15.00	20.00	40.00	55.00	55.00	55.00	
Price, Galv..... Each	20.00	20.00	26.25	26.25	35.00	70.00	95.00	95.00	95.00	



TUCKER CONNECTIONS

NO. 1048

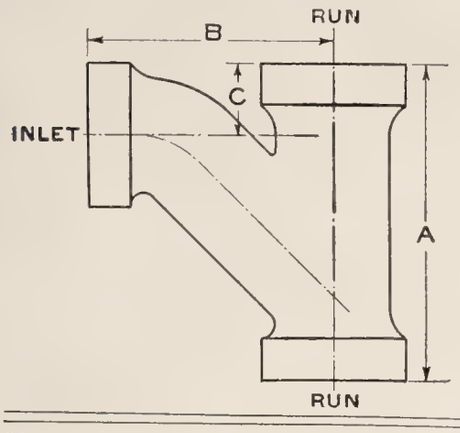
CODE: HUTTENAMT

Size.....Inches	*2	*3	4	5	6	8
Size.....Millimeters	50	76	100	125	150	200
Dimension A.....Inches	4½	4¾	7	7	7	7
Price.....Each	.80	2.00	3.25	6.00	8.75	21.00
Price, Galvanized.....Each	1.40	3.50	5.70	10.50	15.25	37.00

The inlets on Reducing Fittings are always the smallest openings.

*These sizes not furnished with loose rings.

DIMENSIONS SUBJECT TO A SLIGHT VARIATION AND CHANGE WITHOUT NOTICE



DRAINAGE FITTINGS

CAST IRON

SCREWED FOR WROUGHT PIPE

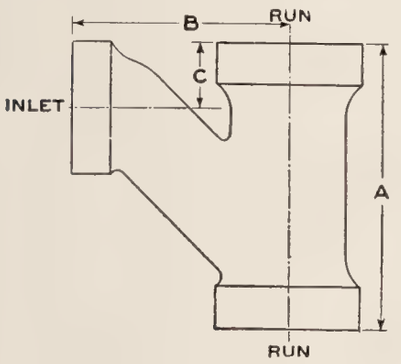
90° LONG TURN Y BRANCHES

No. 1022

TEE PATTERN

CODE: HYALITHE

Size.....Inches	1¼	1½	2	2½	3	4	5	6	7	8
Size.....Millimeters	32	38	50	64	76	100	125	150	175	200
Dimension A .....Inches	4¾	5⅜	7 1/16	8¼	9 13/16	13¾	15¾	18 11/16	21⅝	24 9/16
Dimension B .....Inches	3⅝	4⅛	5 7/16	6¼	7½	9⅞	12¼	14 9/16	16⅞	19 5/16
Dimension C .....Inches	1 3/16	1¼	1⅝	2	2 5/16	2⅞	3½	4⅛	4¾	5¼
Price.....Each	.57	.70	1.10	2.40	3.35	6.00	9.50	20.00	30.00	40.00
Price, Galvanized.....Each	1.00	1.22	1.95	4.20	5.85	10.50	16.50	35.00	52.50	70.00



REDUCING 90° LONG TURN Y BRANCHES

No. 1023

TEE PATTERN

CODE: HYDROPICUM

Size.....Inches	1¼x1	1½x1	1½x1¼	2x1	2x1¼	2x1½	2½x1	2½x1¼	2½x1½	2½x2	3x1½	3x2
Size.....Millimeters	32x25	38x25	38x32	50x25	50x32	50x38	64x25	64x32	64x38	64x50	76x38	76x50
Dimension A .....Inches	4¼	4½	5⅛			5¾			5¾	7⅜	5 15/16	7 9/16
Dimension B .....Inches	3½	3⅝	3⅞			4⅜			4 9/16	5¾	5	6 1/16
Dimension C .....Inches	1	1	1 3/16			1 5/16			1 5/16	1⅝	1 5/16	1⅝
Price.....Each	.63	.80	.80	1.20	1.20	1.20	2.65	2.65	2 65	2.65	3.75	3.75
Price, Galvanized...Each	1.10	1.40	1.40	2.10	2.10	2.10	4 65	4.65	4.65	4.65	6.55	6.55

Size.....Inches	3x2½	4x1½	4x2	4x2½	4x3	5x1½	5x2	5x2½	5x3	5x4	6x2	6x3
Size ...Millimeters	76x64	100x38	100x50	100x64	100x76	125x38	125x50	125x64	125x76	125x100	150x50	150x76
Dim. A ....Inches		6 1/16	7 11/16	8⅝	10	6 5/16	7¾		10¼	13	7 15/16	10⅜
Dim. B ....Inches		5 7/16	6⅝	7 1/16	8 1/16	6	7⅛		8⅝	10 7/16	7¾	9⅛
Dim. C ....Inches		1 5/16	1⅝	2	2⅜	1⅜	1⅝		2⅜	2⅞	1⅝	2 5/16
Price.....Each	3.75	6.60	6.60	6.60	6.60	10.50	10.50	10.50	10.50	10.50	22.00	22.00
Price, Galv ..Each	6 55	11.55	11 55	11.55	11.55	18.50	18.50	18.50	18.50	18.50	38.50	38.50

Size.....Inches	6x4	6x5	7x3	7x4	7x5	7x6	8x3	8x4	8x6	10x4	12x5
Size....Millimeters	150x100	150x125	175x76	175x100	175x125	175x150	200x76	200x100	200x150	250x100	300x125
Dim. A.....Inches	13 1/16	16 1/16	10⅞	13 5/16			10⅝	13⅜		14	17
Dim. B.....Inches	11	12 13/16	9 11/16	11⅝			10¼	12		13	15½
Dim. C.....Inches	2⅞	3½	2⅝	2⅞			2 5/16	2 15/16		3	4
Price.....Each	22.00	22 00	33.00	33.00	33.00	33.00	44.00	44.00	44.00	60.00	85.00
Price, Galv...Each	38.50	38.50	58 00	58 00	58.00	58.00	77.00	77.00	77.00	102.00	150.00

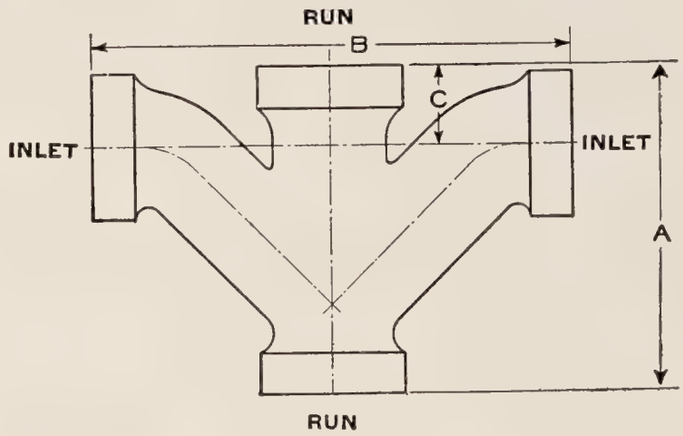
The inlet of 90° Long Turn Y Branches is tapped, pitched ¼-inch to the foot.

The inlets on Reducing Fittings are always the smallest openings.

DIMENSIONS SUBJECT TO A SLIGHT VARIATION AND CHANGE WITHOUT NOTICE

DRAINAGE FITTINGS

CAST IRON **SCREWED FOR WROUGHT PIPE**

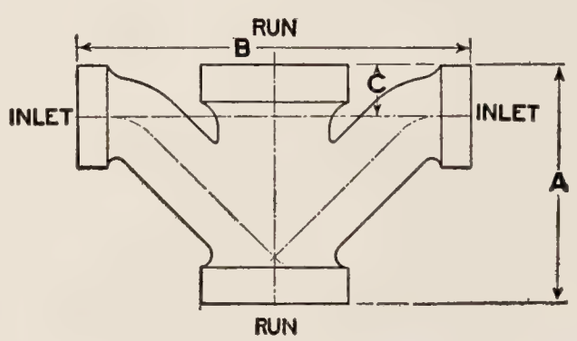


DOUBLE 90° LONG TURN Y BRANCHES

NO. 1026. TEE PATTERN

CODE: HYPOLYDIAN

Size.....Inches	1¼	1½	2	2½	3	4	5	6	7	8
Size.....Millimeters	32	38	50	64	76	100	125	150	175	200
Dim. A.....Inches	4 3/4	5 3/8	7 1/16	8 1/4	9 13/16	13 3/4	15 3/4	18 11/16	21 5/8	24 9/16
Dim. B.....Inches	7 1/4	8 1/4	10 7/8	12 1/2	15	19 3/4	24 1/2	29 1/8	33 3/4	38 5/8
Dim. C.....Inches	1 3/16	1 1/4	1 5/8	2	2 5/16	2 7/8	3 1/2	4 1/8	4 3/4	5 1/4
Price.....Each	1.00	1.10	1.75	3.60	5.00	9.00	14.00	30.00	45.00	60.00
Price, Galv.....Each	1.75	1.95	3.10	6.30	8.75	15.75	24.50	52.50	79.00	105.00



DOUBLE REDUCING 90° LONG TURN Y BRANCHES

NO. 1027. TEE PATTERN

CODE: IDEASSERO

Size.....Inches	1¼x1	1½x1	1½x1¼	2x1¼	2x1½	2½x1¼	2½x1½	3x1½
Size.....Millimeters	32x25	38x25	38x32	50x32	50x38	64x32	64x38	76x38
Dimension A.....Inches	4¼	4½	5 1/8		5 3/4		5 3/4	5 15/16
Dimension B.....Inches	7	7¼	7 3/4		8 3/4		9 1/8	10
Dimension C.....Inches	1	1	1 3/16		1 5/16		1 5/16	1 5/16
Price.....Each	1.10	1.25	1.25	1.90	1.90	4.00	4.00	5.50
Price, Galvanized..Each	1.90	2.25	2.25	3.35	3.35	7.00	7.00	9.65

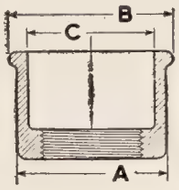
Size.....Inches	3x2	4x2	4x3	5x4	6x2	6x4	6x5
Size.....Millimeters	76x50	100x50	100x76	125x100	150x50	150x100	150x125
Dimension A.....Inches	7 9/16	7 11/16	10	13	7 15/16	13 1/16	16 1/16
Dimension B.....Inches	12 1/8	13 1/4	16 1/8	20 7/8	15 1/2	22	22 5/8
Dimension C.....Inches	1 5/8	1 5/8	2 3/8	2 7/8	1 5/8	2 7/8	3 1/2
Price.....Each	5.50	10.00	10.00	15.50	33.00	33.00	33.00
Price, Galv.....Each	9.65	17.50	17.50	27.00	58.00	58.00	58.00

The inlets of Double 90° Long Turn Y Branches are tapped, pitched ¼-inch to the foot.

The inlets on Reducing Fittings are always the smallest openings.

DRAINAGE FITTINGS

CAST IRON **SCREWED FOR WROUGHT PIPE**



HUB CONNECTIONS

NO. 1034

CODE: IJLHOOFDEN

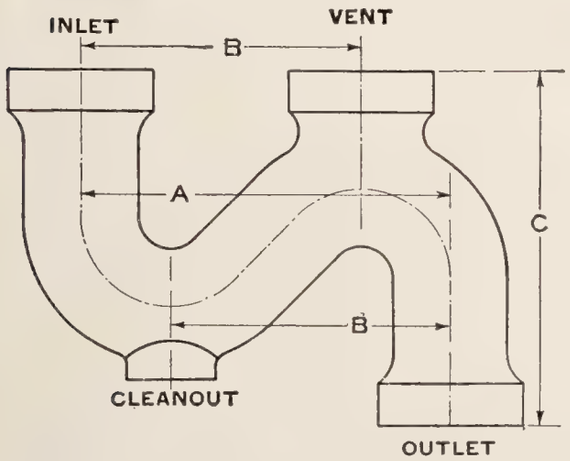
Size ..... Inches	2	3	4	5	6
Size ..... Millimeters	50	76	100	125	150
Dimension A ..... Inches	3 1/2	4 9/16	5 5/8	6 11/16	7 3/4
Dimension B ..... Inches	3 13/16	4 15/16	6	7 1/16	8 3/16
Dimension C ..... Inches	3	4 1/8	5 1/8	6	7 1/8
Price ..... Each	1.15	1.20	1.50	2.00	4.25
Price, Galvanized ..... Each	2.00	2.10	2.60	3.50	7.40

BRASS SOLDERING NIPPLES

NO. 1035

CODE: IMAGINABAR

Size ..... Inches	1	1 1/4	1 1/2	2	3	4	5
Size ..... Millimeters	25	32	38	50	76	100	125
Price ..... Each	.80	.90	1.05	1.50	2.75	4.00	9.00



S TRAPS

NO. 1036

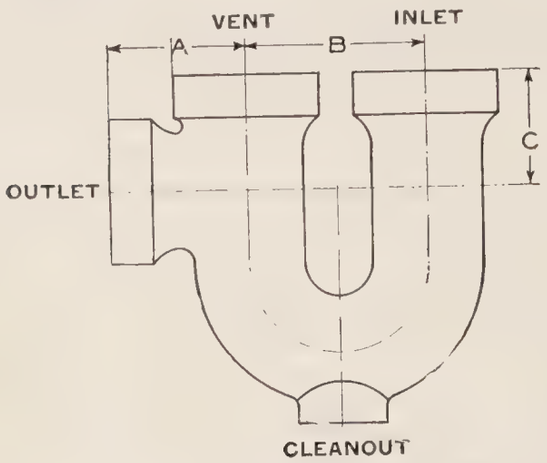
CODE: IMAGINETTA

Size ..... Inches	2	3	4	5	6
Size ..... Millimeters	50	76	100	125	150
Dimension A ..... Inches	8 1/4	10 3/4	14 1/8	16 3/4	20 1/4
Dimension B ..... Inches	6 1/4	8 1/16	10 5/8	12 9/16	15 3/16
Dimension C ..... Inches	8	11 1/4	13 3/4	16 7/8	19 3/4
Size of Cleanout ..... Inches	1	1 1/4	2	2	2
Size of Cleanout ..... Millimeters	25	32	50	50	50
Size of Vents ..... Inches	2	3	4	4	4
Size of Vents ..... Millimeters	50	76	100	100	100
Price ..... Each	4.00	9.25	14.00	21.00	36.00
Price, Galvanized ..... Each	7.00	16.00	24.00	37.00	63.00

DIMENSIONS SUBJECT TO A SLIGHT VARIATION AND CHANGE WITHOUT NOTICE

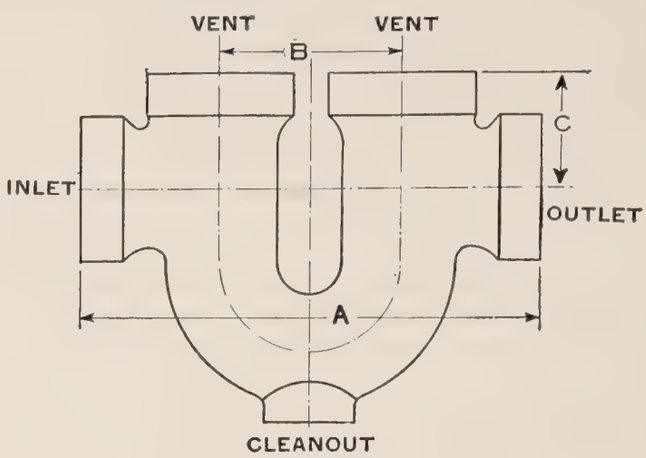
DRAINAGE FITTINGS

CAST IRON



HALF S TRAPS
NO. 1037
CODE: IMOSCAPO

SCREWED FOR WROUGHT PIPE



RUNNING TRAPS
NO. 1038
CODE: IMPAMPINA

HALF S TRAPS

Size.....Inches	1¼	1½	2	3	4	5	6	7	8
Size.....Millimeters	32	38	50	76	100	125	150	175	200
Dimension A.....Inches	2 5/16	2½	3 1/16	4 3/16	5⅛	6 1/16	6 9/16	7¾	8 15/16
Dimension B.....Inches	3⅛	3⅜	4	5⅜	7	8⅜	10⅛	11¼	12⅜
Dimension C.....Inches	2	2¼	2 9/16	3½	4 3/16	4¾	5 7/16	6⅛	6¾
Size of Vent.....Inches	1¼	1½	2	3	4	4	4	5	6
Size of Vent.....Millimeters	32	38	50	76	100	100	100	125	150
Size of Cleanout.....Inches	¾	1	1	1¼	2	2	2	2	3
Size of Cleanout. Millimeters	19	25	25	32	50	50	50	50	76
Price.....Each	1.55	1.70	2.20	5.00	10.00	21.50	32.50	40.00	55.00
Price,Galvanized.....Each	2.70	3.00	3.85	8.75	17.50	37.50	57.00	70.00	95.00

RUNNING TRAPS

Size.....Inches	1¼	1½	2	3	4	5
Size.....Millimeters	32	38	50	76	100	125
Dimension A.....Inches	7¾	8⅜	10⅛	13¼	17¼	20½
Dimension B.....Inches	3⅛	3⅜	4	5⅜	7	8⅜
Dimension C.....Inches	2	2¼	2 9/16	3½	4 3/16	4¾
Size of Vent.....Inches	1¼	1½	2	3	4	4
Size of Vent.....Millimeters	32	38	50	76	100	100
Size of Cleanout.....Inches	¾	1	1	1¼	2	2
Sizeof Cleanout.....Millimeters	19	25	25	32	50	50
Price.....Each	2.40	2.70	3.30	5.50	9.75	24.50
Price, Galvanized.....Each	4.20	4.70	5.75	9.50	17.00	43.00

Size.....Inches	6	7	8	10	12	14
Size.....Millimeters	150	175	200	250	300	350
Dimension A.....Inches	23¼	26¾	30¼	36¼	41⅞	45
Dimension B.....Inches	10⅛	11¼	12⅜	14¾	17	18½
Dimension C.....Inches	5 7/16	6⅛	6¾	8¼	9½	10½
Size of Vent.....Inches	4	5	6	6	6	8
Size of Vent...Millimeters	100	125	150	150	150	200
Size of Cleanout....Inches	2	2	3	3	3	4
Size of Cleanout Millimeters	50	50	76	76	76	100
Price.....Each	33.50	50.00	65.00	115.00	180.00	300.00
Price, Galvanized....Each	58.50	87.50	115.00	200.00	300.00	500.00

The outlet of Half S Traps and inlet and outlet of Running Traps are tapped, pitched ¼-inch to the foot.

DIMENSIONS SUBJECT TO A SLIGHT VARIATION AND CHANGE WITHOUT NOTICE

DRAINAGE FITTINGS

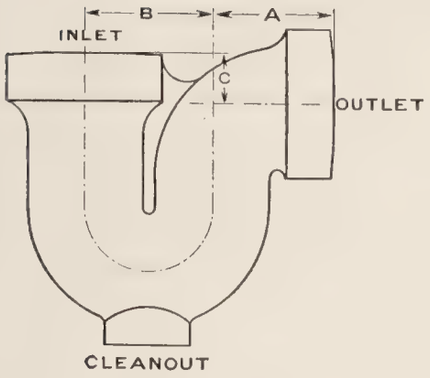
CAST IRON

SCREWED FOR WROUGHT PIPE

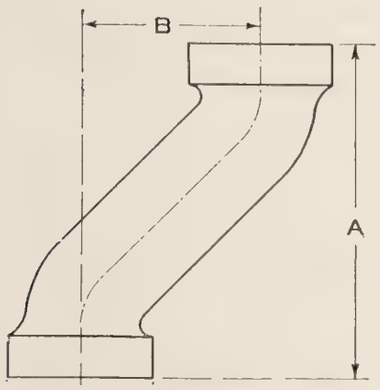
P TRAPS

NO. 1059

CODE: IMPRIMIMUS



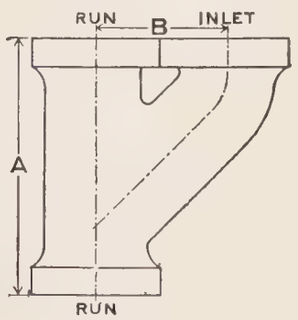
Size.....Inches	1¼	1½	2	3
Size.....Millimeters	32	38	50	76
Dimension A.....Inches	1 15/16	2⅛	2 9/16	3⅜
Dimension B.....Inches	2	2¼	2¾	3¾
Dimension C.....Inches	¾	⅞	⅞	1 3/16
Size of Cleanout.....Inches	¾	1	1	1¼
Size of Cleanout...Millimeters	19	25	25	32
Black.....Each	1.45	1.55	2.00	4.70
Galvanized.....Each	2.55	2.70	3.50	8.25



OFFSETS

NO. 1039

CODE: IMPRODICTA



SPECIAL UPRIGHT Y BRANCHES

NO. 1049

CODE: INCAVILLOR

OFFSETS

Size.....Inches	2	2	2	2	3	3	3	3	4	4	4
Size.....Millimeters	50	50	50	50	76	76	76	76	100	100	100
Offset B.....Inches	4	6	8	10	4	6	8	10	4	6	8
Length A.....Inches	7½	9½	11½	13½	8¾	10¾	12¾	14¾	9¾	11¾	13¾
Price.....Each	2.15	2.40	2.60	2.85	3.35	4.00	4.75	5.50	5.00	5.75	6.50
Price, Galv.....Each	3.75	4.20	4.55	5.00	5.85	7.00	8.30	9.65	8.75	10.00	11.35

Size.....Inches	4	4	5	5	5	5	6	6	6	6
Size...Millimeters	100	100	125	125	125	125	150	150	150	150
Offset B....Inches	10	12	6	8	10	12	6	8	10	12
Length A...Inches	15¾	17¾	12 5/8	14 5/8	16 5/8	18 5/8	13 5/8	15 5/8	17 5/8	19 5/8
Price.....Each	7.50	8.50	9.00	10.00	11.00	12.00	12.50	13.50	14.50	15.50
Price, Galv...Each	13.15	15.00	15.75	17.50	19.25	21.00	22.00	23.50	25.50	27.00

SPECIAL UPRIGHT Y BRANCHES

Size.....Inches	2x1½	2½x1½	2½x2	3x2	3x3	4x2	4x4
Size.....Millimeters	50x38	64x38	64x50	76x50	76x76	100x50	100x100
Dimension A....Inches	5⅞	5 15/16	7⅛	9 11/16	9 11/16	7⅛	11¾
Dimension B....Inches	2 15/16	3 5/16	3⅝	4⅝	4⅝	4 9/16	5 13/16
Price.....Each	2.90	4.50	4.50	6.00	5.50	8.75	8.00
Price, GalvanizedEach	5.10	7.75	7.75	10.50	9.75	15.25	14.00

DIMENSIONS SUBJECT TO A SLIGHT VARIATION AND CHANGE WITHOUT NOTICE

DRAINAGE FITTINGS
FOR
WALL CLOSETS

The line of drainage "Y's" illustrated on the following pages has been designed for use wherever back or wall outlet closets are installed in batteries. They are especially adaptable for buildings of reinforced concrete construction. Using these fittings in connection with wall hung closets eliminates the necessity of cutting and thus weakening the floors, as the HORIZONTAL WASTE LINE IS ENTIRELY ABOVE THE FLOOR.

Before the advent of these fittings it was always necessary to suspend the horizontal waste line of a battery of closets from the ceiling below, unless a groove was made in the floor or the floor of the toilet room raised. All of these methods are objectionable but are necessary where ordinary drainage fittings are used.

As will be seen from the illustrations, these fittings are tapped for the closet connection at different distances from the center of the run, so that when the closets in a battery are set in line and the fittings placed in consecutive order according to the tapping numbers given them, the waste line is given a pitch.

Each fitting takes the place of a drainage tee, nipple and "Y" (required where regular fittings are used), reducing the number of joints for each closet and simplifying the piping.

The regular tapping shown in the dimension tables will take care of batteries up to twelve closets.

When six or less closets are installed in a single battery, we recommend that fittings with the odd tapping numbers be specified, which will give the maximum amount of pitch. As an example, when fittings for six closets are required, the first fitting from the stack should be specified with "Tapping No. 1," second, "Tapping No. 3," third, "Tapping No. 5," etc., with "Tapping No. 11," for the sixth closet. The differences in the tapping dimensions will give additional pitch to the horizontal drainage waste line.

For sanitary reasons, the long turn fittings should be used wherever possible, and will be sent on orders unless the short turn is specified.

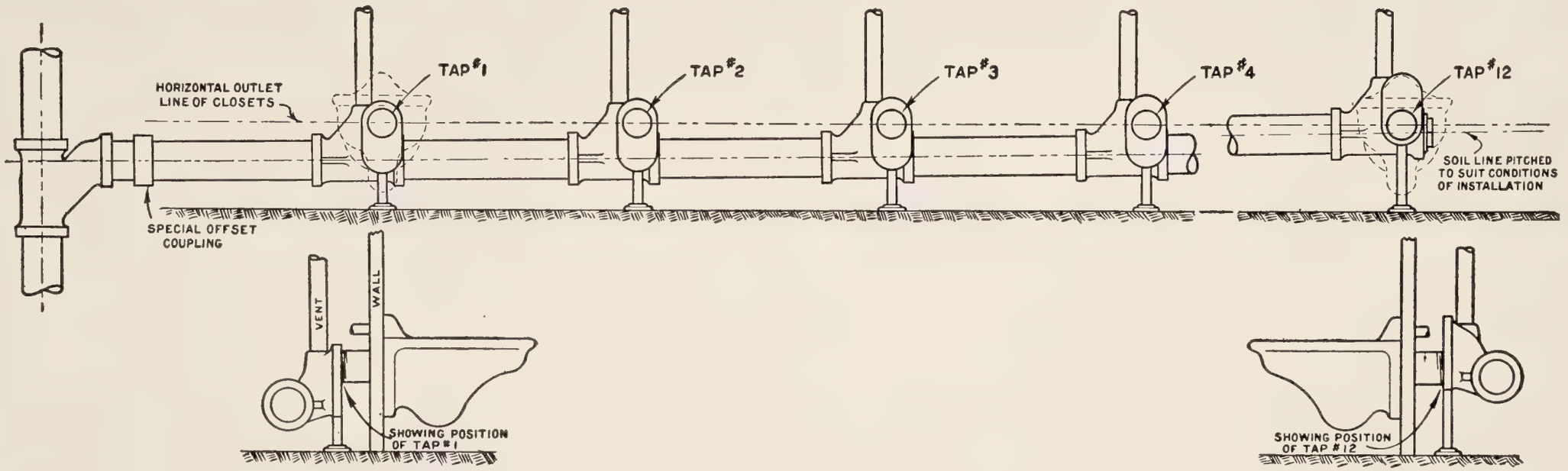
The long turn fittings are made in the 4x4 and 4x5-inch sizes, either right or left hand and single or double.

The short turn fittings are made for use where the utility corridors are narrow and are also furnished in the 4x4 and 4x5-inch sizes, right or left hand, but in single pattern only.

When ordering, give catalogue number, size, tapping number, and, if single fitting, whether right or left hand, also if black or galvanized.

Facing inlet of fitting, if stack is to the left, the fittings are right hand, and if to the right, the fittings are left hand.

GENERAL ARRANGEMENT, SHOWING AN INSTALLATION OF A BATTERY OF CLOSETS



The fitting with the highest tapping position should always be installed next to the soil stack. This fitting is marked No. 1. The second one from the stack is No. 2, and so on. The fitting with the lowest tapping position is No. 12. The different tapping positions are $\frac{3}{8}$-inch from center to center.

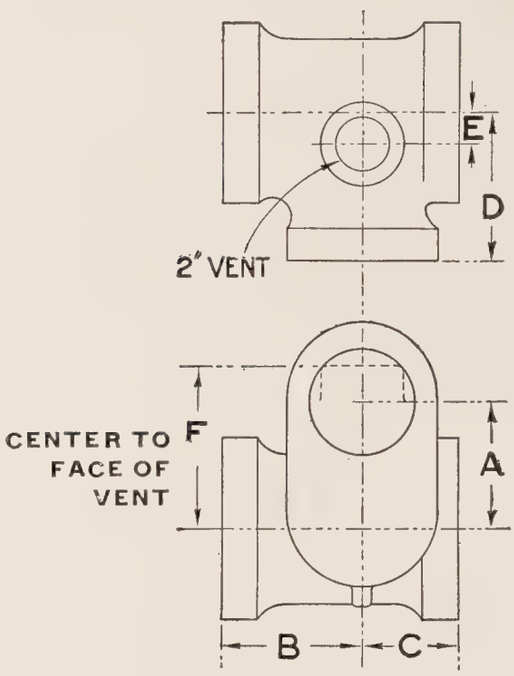
To get all closet seats the same distance from the floor level, also to take care of the pitch, of the soil line, we provide a special pitched coupling which should preferably be used next to the stack. By turning this coupling, proper installation of the closet combinations is readily made possible.

DRAINAGE FITTINGS

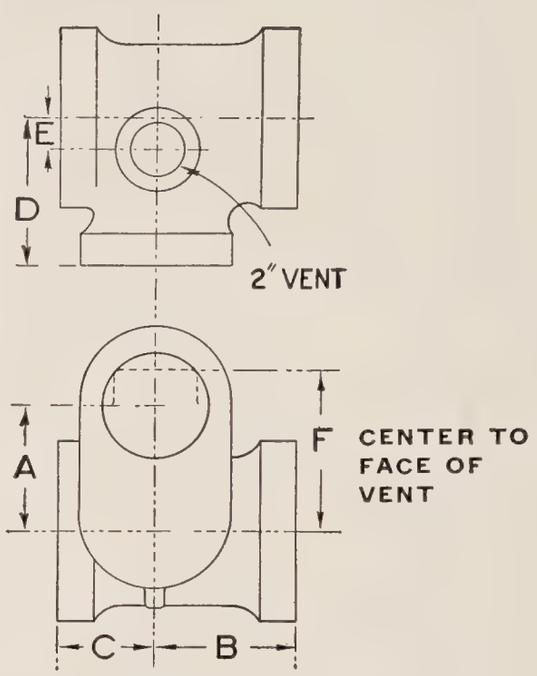
CAST IRON — SCREWED FOR WROUGHT PIPE

SHORT TURN Y FOR BATTERY OF CLOSETS

(PATENTED APRIL 21, 1915)



No. 1066
RIGHT HAND
CODE: INCLUDAMUS



No. 1068
LEFT HAND
CODE: INEDIFIANT

TAPPINGS AND DIMENSIONS

4x4							5x4						
Tapping No.	A In.	B In.	C In.	D In.	E In.	F Center to Face of Vent In.	Tapping No.	A In.	B In.	C In.	D In.	E In.	F Center to Face of Vent In.
1	2 5/8	5 1/4	3 1/2	5 1/4	0	3	1	4 7/8	5 3/8	3 3/4	5 3/4	1 1/4	6 1/4
2	2 1/4	5 1/4	3 1/2	5 1/4	0	3	2	4 1/2	5 3/8	3 3/4	5 3/4	1 1/4	6 1/4
3	1 7/8	5 1/4	3 1/2	5 1/4	0	3	3	4 1/8	5 3/8	3 3/4	5 3/4	1 1/4	6 1/4
4	1 1/2	5 1/4	3 1/2	5 1/4	0	3	4	3 3/4	5 3/8	3 3/4	5 3/4	1 1/4	6 1/4
5	1 1/8	5 1/4	3 1/2	5 1/4	0	3	5	3 3/8	5 3/8	3 3/4	5 3/4	1 1/4	6 1/4
6	3/4	5 1/4	3 1/2	5 1/4	0	3	6	3	5 3/8	3 3/4	5 3/4	1 1/4	6 1/4
							7	2 5/8	5 3/8	3 3/4	5 3/4	1 1/4	6 1/4
							8	2 1/4	5 3/8	3 3/4	5 3/4	1 1/4	6 1/4
							9	1 7/8	5 3/8	3 3/4	5 3/4	1 1/4	6 1/4
							10	1 1/2	5 3/8	3 3/4	5 3/4	1 1/4	6 1/4
							11	1 1/8	5 3/8	3 3/4	5 3/4	1 1/4	6 1/4
							12	3/4	5 3/8	3 3/4	5 3/4	1 1/4	6 1/4

PRICES

Size ..... Inches	4x4	4x5
No. 1066, R. H. ..... Each	17.00	20.00
No. 1066, R. H. Galvanized ..... Each	22.00	26.50
No. 1068, L. H. ..... Each	17.00	20.00
No. 1068, L. H. Galvanized ..... Each	22.00	26.50

DIMENSIONS SUBJECT TO A SLIGHT VARIATION AND CHANGE WITHOUT NOTICE

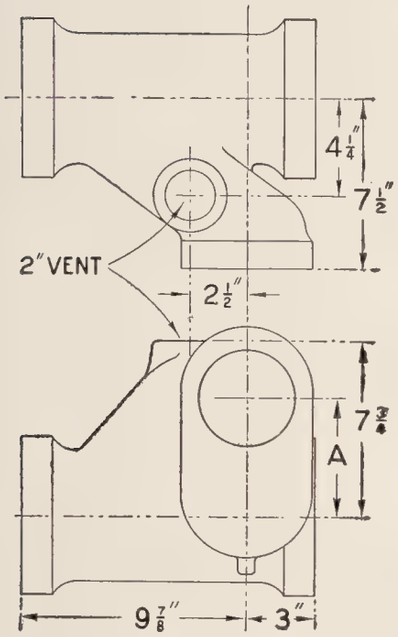
DRAINAGE FITTINGS

CAST IRON

SCREWED FOR WROUGHT PIPE

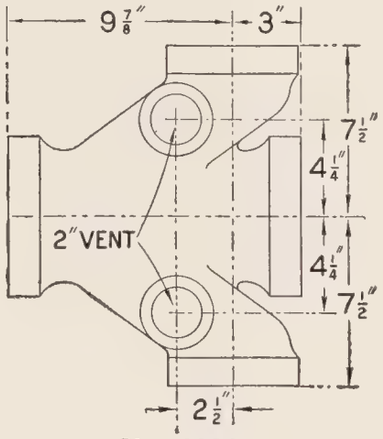
LONG TURN Y FOR BATTERY OF CLOSETS

(PATENTED APRIL 21, 1915)



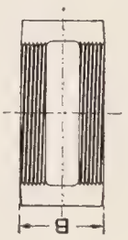
No. 1060
RIGHT HAND

CODE: INEGUALITA



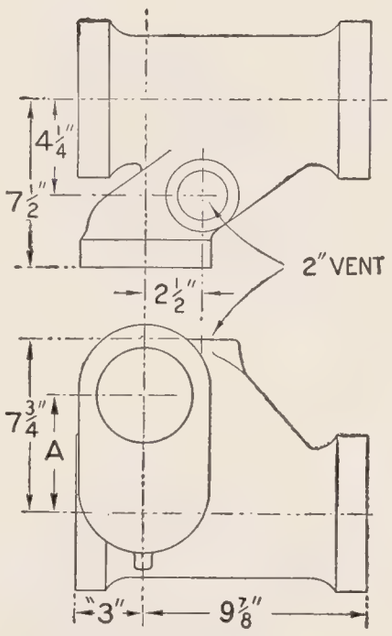
No. 1064
DOUBLE

CODE: INEQUABILE



No. 1069
OFFSET COUPLING

CODE: INERTICULA



No. 1062
LEFT HAND

CODE: INENARRATA

TAPPINGS

4″x4″ and 5″x4″	
Tapping No.	Dimension A
1	5¼
2	4⅞
3	4½
4	4⅛
5	3¾
6	3⅜
7	3
8	2⅝
9	2¼
10	1⅞
11	1½
12	1⅛

PRICES

Size.....Inches	4x4	5x4
No. 1060, R. H.....Each	20.00	22.50
No. 1060, R. H. Galvanized.....Each	26.50	31.00
No. 1062, L. H.....Each	20.00	22.50
No. 1062, L. H. Galvanized.....Each	26.50	31.00
No. 1064, Double.....Each	28.00	31.00
No. 1064, Double Galvanized.....Each	38.00	41.00

PRICES OF COUPLINGS

Size.....Inches	4	5
No. 1069, Coupling.....Each	2.30	4.25
No. 1069, Coupling, Galvanized.....Each	4.00	7.40
B—Length.....Inches	2⅝	2¾

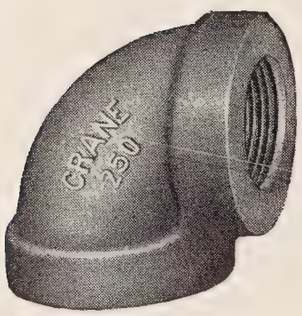
DIMENSIONS SUBJECT TO A SLIGHT VARIATION AND CHANGE WITHOUT NOTICE

EXTRA HEAVY

CAST IRON CAR HEATER FITTINGS

FOR STEAM WORKING PRESSURES UP TO 250 POUNDS

THESE FITTINGS ARE TESTED TO HYDRAULIC PRESSURES CORRESPONDING TO THE ABOVE WORKING PRESSURES



CODE: INFACCENDO

ELBOWS

Size Inches	Price R. H. Each	Price R. and L. Each
½	.22	.22
¾	.25	.25
1	.27	.27
1¼	.30	.30
1½x1¼	.45	.45
1½	.45	.45
2	.55	.55

CODE: INFALLINO

TEES

Size Inches	Price Each
½	.30
¾	.35
1	.40
1¼	.45
1¼x¾x1¼	.45
1¼x1¼x¾	.45
1¼x1¼x½	.45
1½x1½x¾	.65
1½	.65
2	.85

CODE: INFAMABARE

RETURN BENDS

Size Inches	Distance Between Centers	Price R. H. Each	Price R. and L. Each
1	2⅜	.45	.52
1¼	2½	.45	.52
1¼	3	.50	
1¼	4	.60	
1¼	5	.70	
1¼	6	.85	
1¼	8	1.10	
1½	2½	.80	.90
1½	3½	1.25	1.45
2	3¼	1.00	1.15
2	4½	1.75	
2	6	2.00	

RETURN BENDS WITH BACK OUTLET PRICES ON APPLICATION

Size Inches	C. to C.	Back Outlet
2	4	1½
1½	3½	1½

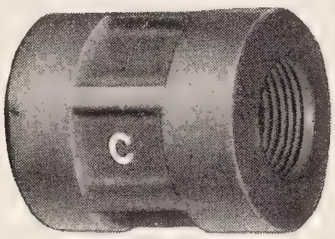
These Fittings can be furnished air tested when so ordered. Prices according to quantity wanted.

EXTRA HEAVY

CAR HEATER COUPLINGS

FOR STEAM WORKING PRESSURES UP TO 250 POUNDS.

THESE FITTINGS ARE TESTED TO HYDRAULIC PRESSURES CORRESPONDING TO THE ABOVE WORKING PRESSURE.



CAST IRON

CODE: INFANGASTE

Size Inches	Size Millimeters	Price R. H. Each	Price R. and L. Each	Size Inches	Size Millimeters	Price R. H. Each	Price R. and L. Each
1	25	.25	.35	1½	38	.45	.55
1¼	32	.30	.40	2	50	.55	.65

WROUGHT IRON

CODE: INFANTINHO

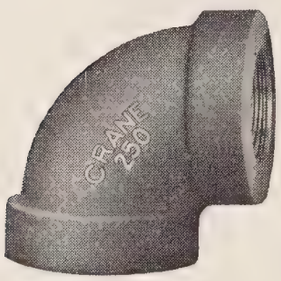
Size Inches	Size Millimeters	Actual Outside Diameter Inches	Length of Couplings Inches	Price R. H. Black Each	Price R. and L. Black Each	Price R. H. Galvanized Each	Price R. and L. Galvanized Each
½	13	1⅛	1⅞	.14	.20	.20	.25
¾	19	1 7/16	2⅛	.20	.30	.25	.35
1	25	1⅝	2⅜	.26	.40	.32	.45
1¼	32	2⅛	2⅛	.34	.45	.42	.55
1½	38	2 5/16	2⅞	.42	.55	.55	.70
2	50	2 13/16	3⅛	.56	.70	.75	.90

These Fittings can be furnished Air Tested when so ordered. Prices according to quantity wanted.

LONG PATTERN—EXTRA HEAVY

CAST IRON FITTINGS

FOR SATURATED STEAM WORKING PRESSURES UP TO 250 POUNDS



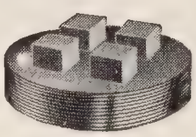
ELBOW
CODE: INFELLONIA

THESE FITTINGS ARE TESTED TO HYDRAULIC PRESSURES CORRESPONDING TO THE ABOVE WORKING PRESSURE

For Extra Heavy Cast Iron Return Bends, see page 404.

45° ELBOW
CODE: INFOCHERO

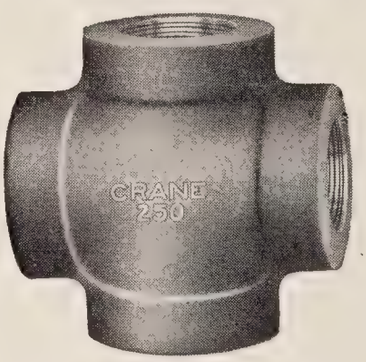
TEE
CODE: INFORMIBUS



PLUG
BAR STYLE

6-inch and larger are made "bar" style; 5-inch and smaller are Square Head.

CODE: JEYUNASE



CROSS
CODE: JEDENNOCH

Size.....Inches	½	¾	1	1¼	1½	2	2½	3	3½
Size.....Millimeters	13	19	25	32	38	50	64	76	90
Elbows.....Each	.25	.30	.35	.45	.60	.75	1.25	2.00	2.75
Elbows, Reducing.....Each		.40	.45	.55	.75	.95	1.55	2.50	
45° Elbows.....Each	.35	.40	.44	.55	.70	.90	1.50	2.50	3.50
Tees.....Each	.40	.45	.55	.70	.90	1.15	1.80	3.00	4.25
Tees, Reducing.....Each		.60	.70	.90	1.15	1.40	2.25	3.75	5.30
Crosses.....Each			.70	.90	1.20	1.50	2.50	4.00	5.50
Y Bends.....Each				1.35	1.80	2.25	3.75	6.00	
Plugs.....Each	.04	.06	.08	.09	.11	.15	.27	.38	.57

Size.....Inches	4	4½	5	6	7	8	10	12
Size.....Millimeters	100	113	125	150	175	200	250	300
Elbows.....Each	3.50	4.25	5.50	8.00	12.00	17.00	28.00	40.00
Elbows, Reducing.....Each	4.40		6.80					
45° Elbows.....Each	4.50	5.50	6.75	9.75	14.50	21.00	34.00	48.00
Tees.....Each	5.50	6.75	8.25	12.00	18.00	25.00	42.00	60.00
Tees, Reducing.....Each	6.85	8.50	10.25	15.00	22.50	31.00	52.00	75.00
Crosses.....Each	7.00	8.50	11.00	16.00	24.00	34.00	56.00	80.00
Y Bends.....Each	11.00			24.00	36.00	50.00		
Plugs.....Each	.63	1.00	1.35	1.80		4.15	5.75	7.50

GALVANIZED EXTRA HEAVY FITTINGS ARE DOUBLE ABOVE LIST

The radius of these Fittings is longer than the ordinary screwed fittings.

We do not recommend the use of Screwed Fittings above 6-inch for steam lines; flanged fittings are more suitable.

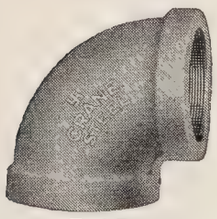
For list of sizes of Reducing Fittings carried in stock, see pages 702 and 703. Should other sizes be wanted, we will make them to order by bushing in the sand to the required size, and will charge extra, according to quantity wanted.

For dimensions, see page 644.

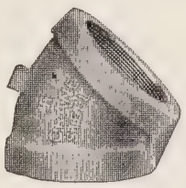
CAST STEEL SCREWED FITTINGS

SERIES 25-80

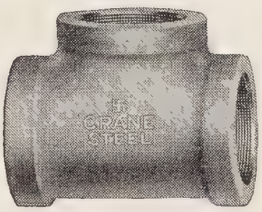
WORKING PRESSURE RATINGS { 250-LB. STEAM AND ANY TOTAL TEMPERATURE UP TO 750° F.
125-LB. OIL OR VAPOR PRESSURE AND TEMPERATURE UP TO 900° F.
800-LB. COLD OIL, GAS AND WATER WORKING PRESSURE
TESTED TO 800 LBS. HYDRAULIC PRESSURE



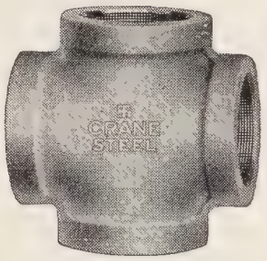
760D
CODE: JODELRUF



762D
CODE: JONCAGINE



764D
CODE: JONGENTJES

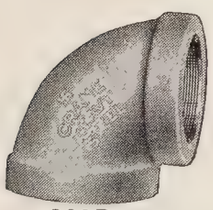


766D
CODE: JOUBARBE

Size	Inches	2½	3	3½	4	4½
Size	Millimeters	64	76	90	100	113
No. 760 D, Elbows	Each	4.75	6.00	7.75	8.50	11.75
No. 762 D, 45° Elbows	Each	4.75	6.00	7.75	8.50	11.75
No. 764 D, Tees	Each	7.10	9.00	11.50	12.75	17.50
No. 766 D, Crosses	Each	9.50	12.00	15.50	17.00	23.50
Size	Inches	5	6	8	10	12
Size	Millimeters	125	150	200	250	300
No. 760 D, Elbows	Each	13.50	16.50	34.00	61.00	92.00
No. 762 D, 45° Elbows	Each	13.50	16.50	34.00	61.00	92.00
No. 764 D, Tees	Each	20.25	25.00	51.00	91.00	138.00
No. 766 D, Crosses	Each	27.00	33.00	68.00	122.00	184.00

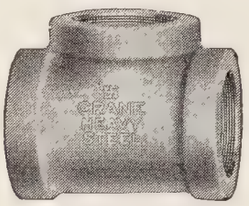
SERIES 40-200

WORKING PRESSURE RATINGS { 400 LBS. STEAM AND ANY TOTAL TEMPERATURE UP TO 800° F.
350 LBS. OIL OR VAPOR PRESSURE AND TEMPERATURE UP TO 900° F.
2000 LBS. COLD OIL, GAS AND WATER WORKING PRESSURE
TESTED TO 2500 LBS. HYDRAULIC PRESSURE



260D
CODE: JOURDAIN

262D
CODE: JOUTATES



264D
CODE: JOVELLANE

266D
CODE: JUBILAVERO

Size	Inches	2½	3	3½	4	4½
Size	Millimeters	64	76	90	100	113
No. 260 D, Elbows	Each	4.75	6.00	7.75	8.50	11.75
No. 262 D, 45° Elbows	Each	4.75	6.00	7.75	8.50	11.75
No. 264 D, Tees	Each	7.10	9.00	11.50	12.75	17.50
No. 266 D, Crosses	Each	9.50	12.00	15.50	17.00	23.00
Size	Inches	5	6	8	10	12
Size	Millimeters	125	150	200	250	300
No. 260 D, Elbows	Each	13.50	16.50	34.00	61.00	92.00
No. 262 D, 45° Elbows	Each	13.50	16.50	34.00	61.00	92.00
No. 264 D, Tees	Each	20.25	25.00	51.00	91.00	138.00
No. 266 D, Crosses	Each	27.00	33.00	68.00	122.00	184.00

All the above fittings have long thread lengths, are strong and rugged. The patterns are made for casting in steel and should not be compared with cast steel fittings made from ordinary cast iron patterns.

Reducers, prices on application.

Reducing fittings made to order.

For dimensions see page 648.

FORGED STEEL SCREWED FITTINGS

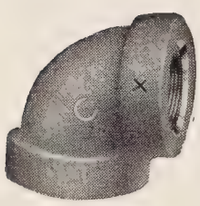
MADE FROM SOLID FORGINGS

3000 POUND HYDRAULIC

FOR SUPERHEATED STEAM OR HOT OIL WORKING PRESSURES UP TO 600 POUNDS AND A TOTAL TEMPERATURE OF 800 DEGREES FAHRENHEIT

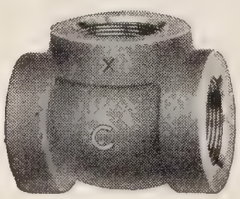
FOR COLD WATER, OIL OR GAS WORKING PRESSURES UP TO 3000 POUNDS HYDROSTATIC

TESTED TO 3000 POUNDS HYDRAULIC PRESSURE

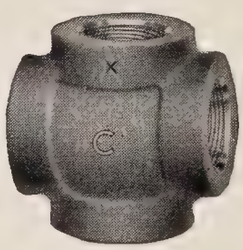


No. 300 D ELBOW
CODE: JUBITERO

No. 302 D 45o ELBOW
CODE: JUCHICOPAL



No. 304 D TEE
CODE: JUCUNDAMUS



No. 307 D CROSS
CODE: JUDAISAMES

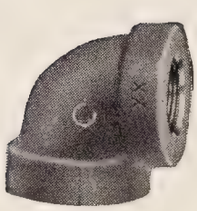
Size .....Inches	¼	⅜	½	¾	1	1¼	1½	2	2½
Size .....Millimeters	6	10	13	19	25	32	38	50	64
No. 300-D Elbows	1.20	1.20	1.25	1.50	1.85	2.50	3.25	4.75	7.25
No. 301-D Reducing Elbows		1.45	1.50	1.80	2.20	3.00	3.90	5.70	8.70
No. 302-D 45° Elbows		1.20	1.25	1.50	1.85	2.50	3.25	4.75	7.25
No. 304-D Tees	1.80	1.80	1.85	2.25	2.75	3.75	4.85	7.15	10.90
No. 306-D Reducing Tees		2.15	2.20	2.70	3.30	4.50	5.80	8.60	13.00
No. 307-D Crosses	Prices on application.								

6000 POUND HYDRAULIC

FOR SUPERHEATED STEAM OR HOT OIL WORKING PRESSURES UP TO 1200 POUNDS AND A TOTAL TEMPERATURE OF 900° FAHRENHEIT

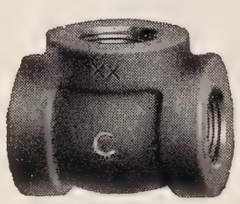
FOR COLD WATER, OIL OR GAS WORKING PRESSURES UP TO 6000 POUNDS HYDROSTATIC

TESTED TO 6000 POUNDS HYDRAULIC PRESSURE



No. 310 D ELBOW
CODE: JUDASAPFEL

No. 312 D 45o ELBOW
CODE: JUDENBANDE



No. 314 D TEE
CODE: JUDENHAUBE

No. 317 D CROSS
CODE: JUDENPECH

Size .....Inches	¼	⅜	½	¾	1	1¼	1½	2
Size .....Millimeters	6	10	13	19	25	32	38	50
No. 310-D 90° Elbows	1.25	1.25	1.50	1.85	2.50	3.25	4.75	7.25
No. 311-D 90° Reducing Elbows		1.50	1.80	2.20	3.00	3.90	5.70	8.70
No. 312-D 45° Elbows		1.25	1.50	1.85	2.50	3.25	4.75	7.25
No. 314-D Tees	1.85	1.85	2.25	2.75	3.75	4.85	7.15	10.90
No. 316-D Reducing Tees		2.20	2.70	3.30	4.50	5.80	8.60	13.00
No. 317-D Crosses	Prices on application.							

Larger sizes made to order of Cast Steel. Prices on application.

WORKING PRESSURES

These Fittings are suitable for the working pressures specified above when used in hydraulic installations in which shock is absent or so slight as to be negligible. WHEN SUBJECT TO SHOCK they are NOT recommended for these pressures. See explanatory notes on page 175.

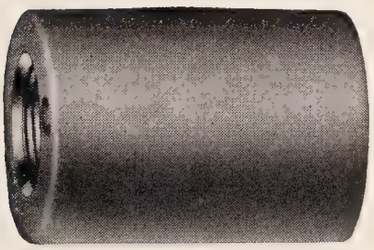
AIR OR GAS

Fittings for Air or Gas are SPECIAL. See explanatory notes on page 175.
For general dimensions, see page 647.

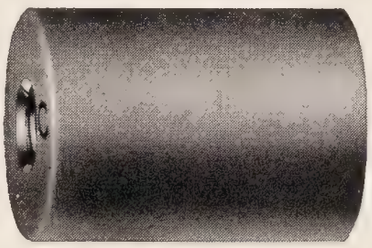
SPECIAL HYDRAULIC

STEEL SCREWED FITTINGS

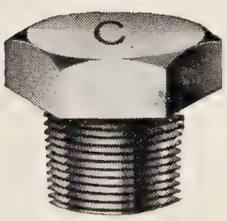
FOR COLD WATER OR OIL WORKING PRESSURES UP TO 6000 POUNDS HYDROSTATIC



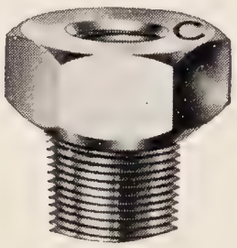
COUPLING
CODE: JUDICASSEM



REDUCING COUPLING
CODE: JUDICATIFS



PLUG
CODE: JUDICATIVO



BUSHING
CODE: JUDICAVAMO

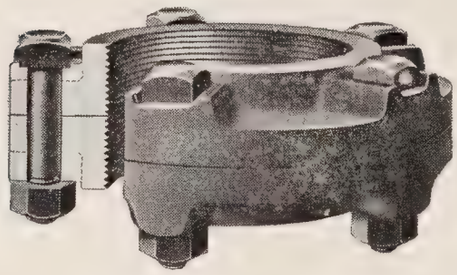
These fittings are made to order only. Prices on application.

WORKING PRESSURES

These fittings are suitable for the working pressures specified above when used in hydraulic installations in which shock is absent or so slight as to be negligible. When subject to shock they are not recommended for these pressures. See explanatory notes on page 175.

AIR OR GAS

Fittings for Air or Gas are special. See explanatory notes on page 175.



CODE: JUFFERDOM

CAST IRON
FLANGE UNIONS
STANDARD
FOR STEAM WORKING PRESSURES UP TO 125 POUNDS

FACED GASKET EXTRA

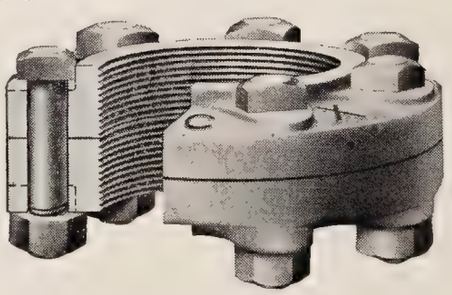
Size.....Inches	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2
Size.....Millimeters	13	19	25	32	38	50	64
Price.....Each	.40	.46	.52	.64	.78	1.00	1.25
Price, Galvanized.....Each	.80	.92	1.04	1.28	1.56	2.00	2.50
Diameter of Flanges.....Inches	2 3/4	3 3/8	3 5/8	4 1/8	4 1/2	5 1/8	5 7/8
Number of Bolts.....	3	3	3	4	4	4	4
Size.....Inches	3	3 1/2	4	4 1/2	5	6	7
Size.....Millimeters	76	90	100	113	125	150	175
Price.....Each	1.50	1.80	2.10	2.70	3.15	3.95	5.50
Price, Galvanized.....Each	3.00	3.60	4.20	5.40	6.30	7.90	11.00
Diameter of Flanges.....Inches	6 5/8	7 1/4	7 3/4	8 3/8	9 1/8	10 3/8	11 5/8
Number of Bolts.....	4	4	5	5	5	6	7
Size.....Inches	8	9	10	12	14	15	16
Size.....Millimeters	200	225	250	300	350	375	400
Price.....Each	7.00	10.00	11.50	16.00	28.00	35.00	60.00
Price, Glavanized.....Each	14.00	20.00	23.00	32.00	56.00	70.00	
Diameter of Flanges.....Inches	12 3/4	13 7/8	15 1/2	17 7/8	20 5/8	20 5/8	23
Number of Bolts.....	8	9	10	12	14	14	16

Sizes 14-inch and larger are to be used with O. D. pipe.

EXTRA HEAVY FLANGE UNIONS

FOR SATURATED STEAM WORKING PRESSURES UP TO 250 POUNDS

FACED GASKET EXTRA



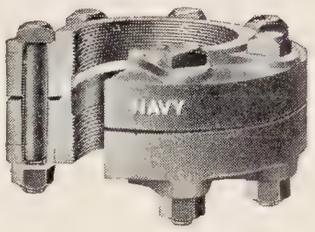
No. 97 E
CODE: JUGIFLUA

Size.....Inches	1/2	3/4	1	1 1/4	1 1/2	2
Size.....Millimeters	13	19	25	32	38	50
Price.....Each	.70	.70	.80	1.00	1.15	1.50
Diameter of Flanges.....Inches	3 1/4	3 1/4	3 5/8	4 1/8	4 5/8	5 3/8
Number of Bolts.....	4	4	4	4	4	5
Size.....Inches	2 1/2	3	3 1/2	4	4 1/2	5
Size.....Millimeters	64	76	90	100	113	125
Price.....Each	1.90	2.25	2.70	3.15	4.00	4.75
Diameter of Flanges.....Inches	6	6 3/4	7 1/2	8	8 3/4	9 3/8
Number of Bolts.....	5	6	6	7	8	8
Size.....Inches	6	7	8	9	10	12
Size.....Millimeters	150	175	200	225	250	300
Price.....Each	6.00	8.25	10.50	15.00	17.25	24.00
Diameter of Flanges.....Inches	10 7/8	12	13 1/4	14 3/8	15 3/4	18
Number of Bolts.....	9	10	10	12	12	14

CAST IRON
FLANGE UNIONS
NAVY
EXTRA HEAVY

FOR STEAM WORKING PRESSURES UP TO 250 POUNDS

GROUND JOINT **BRASS TO IRON SEAT** **NO GASKET REQUIRED**



No. 99 E
CODE: JULGUEMOS

Size.....Inches	¾	1	1¼	1½	2
Size.....Millimeters	19	25	32	38	50
Price.....Each	.60	.80	1.20	1.60	2.00
Diameter Flanges.....Inches	3¼	3⅝	4⅛	4⅝	5⅜
Number of Bolts.....	4	4	4	4	5
Size.....Inches	2½	3	3½	4	4½
Size.....Millimeters	64	76	90	100	113
Price.....Each	3.20	4.80	6.00	7.50	8.75
Diameter Flanges.....Inches	6	6¾	7½	8	8¾
Number of Bolts.....	5	6	6	7	8
Size.....Inches	5	6	7	8	10
Size.....Millimeters	125	150	175	200	250
Price.....Each	10.00	12.50	15.00	18.00	28.80
Diameter Flanges.....Inches	9⅜	10⅞	12	13¼	15¾
Number of Bolts.....	8	9	10	10	12

These Unions have found favor with the trade and are recommended as a superior article.

The brass ring is forced into place by special machinery and cannot loosen.

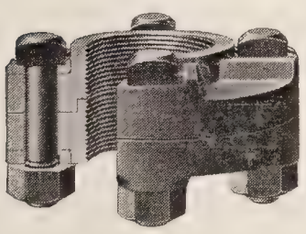
The seats are ground in, so that a tight joint is obtained.

The brass to iron seat eliminates the use of gaskets.

Brass to brass seats will be made to order at special price.

We can furnish these Unions to order, in larger sizes, made of Cast Iron, Ferrosteel, Malleable Iron, Cast Steel or Forged Steel. Prices on Application.

For Flange Unions for higher pressures see page 339.



CODE: JUMENTEUX

OIL COUNTRY PATTERN

EXTRA HEAVY

NOT FACED **GASKET EXTRA**

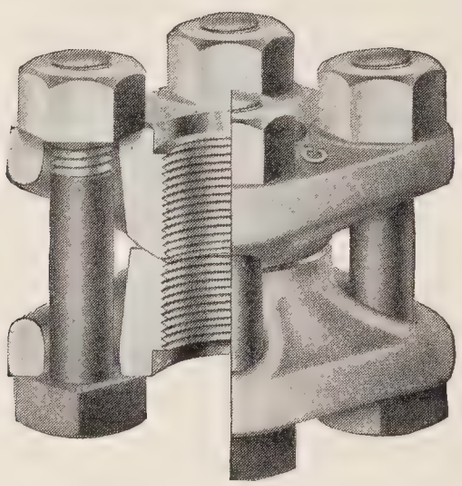
Size.....Inches	2
Size.....Millimeters	50
Price.....Each	1.50
Diameter Flanges.....Inches	5⅜
Number of Bolts.....	4

6000 POUND FORGED STEEL

HYDRAULIC FLANGE UNIONS

FOR COLD WATER OR OIL WORKING PRESSURES UP TO
6000 POUNDS HYDROSTATIC

GROUND JOINT NO GASKET REQUIRED



No. 330 D

FORGED STEEL
CODE: JUMENTITOS

Size.....Inches	½	¾	1	1¼	1½	2	2½
Size.....Millimeters	13	19	25	32	38	50	64
Price.....Each	6.00	7.00	8.00	9.00	10.00	16.00	29.00

WORKING PRESSURES

These Unions are suitable for the working pressures specified above when used in hydraulic installations in which shock is absent or so slight as to be negligible. WHEN SUBJECT TO SHOCK they are NOT recommended for these pressures.

See explanatory notes on page 175.

AIR OR GAS

Unions for Air or Gas are special. See explanatory notes on page 175.

CRANE CEMENT

FOR MAKING TIGHT PIPE JOINTS

PUT UP IN ONE, FIVE, TEN AND TWENTY-POUND CANS, MIXED AND READY FOR USE

ONE-POUND CANS FURNISHED IN CASES CONTAINING 24 CANS

CODE: JUNGSTHIN

LIST PRICE 50 CENTS PER POUND

Crane Cement, now so thoroughly well known to the trade, has been constantly and exclusively used by us in our business for many years, and from our personal experience, we know it to be superior to Red or White Lead, and much more economical, being double in bulk.

Crane Cement reduces friction, so that metal to metal joints may be made more readily than with any other make of cement.

We had occasion to make tight joints in an eight-inch pipe line, so that they would stand 1,000 pounds air pressure. This we accomplished with the regular weight of line pipe and extra heavy couplings using Crane Cement.

Making absolutely tight joints at such pressure, is convincing proof of the superiority of this article.

We have furnished Crane Cement in ton lots for extensive pipe line operations in the oil and gas fields.

The principle involved is to make tight joints, iron to iron, and, as stated before, Crane Cement has these merits. We therefore recommend it to the trade, knowing that it will accomplish satisfactory work.

CRANE CEMENT WILL ALWAYS BE FURNISHED IN ONE-POUND CANS, UNLESS OTHERWISE ORDERED.

MAKING TIGHT SCREWED JOINTS FOR VERY HIGH PRESSURES

BY R. T. CRANE

We are in doubt if the trade clearly understands the conditions that are necessary in order to make good screw joints with pipe and fittings, especially when they are intended to withstand very high pressure, and in any event we think it might be best to put this matter before you once more.

It has been our experience that the ordinary steamfitter, when called upon to put up piping that will be subjected to a pressure of 200 or 300 pounds of steam, feels that he is shouldering a very heavy responsibility; but should he be called upon to make joints that would have to bear 1,000 pounds of air pressure, he might not feel like assuming the responsibility at all; or, should he undertake the work, probably he would feel certain that it would be necessary to resort to extraordinary means to get the desired result. In all probability he would decide that with the ordinary material manufactured and supplied to the general market, such work under these conditions was impossible.

We have demonstrated beyond the possibility of a doubt, that tight joints for 1,000 pounds air may be made with the ordinary line pipe, providing clean cut threads are made, and extraordinary care and intelligence are exercised in putting them together.

The secret of making a tight joint is to avoid or overcome the friction incident to screwing pipe and fittings together.

This friction is due to the large amount of bearing surface, especially when there is grit in the threads and the joints are coming up close to the bearing. Friction produces heat, and heat produces expansion, and as the pipe is lighter than the coupling or fitting, it expands more; then when both become cold the pipe contracts more than the coupling, thus causing a tendency to leak.

Some years ago we ran across an instance where a pipe line was being put together in the field by machinery. The machine would do the work quickly, and the workmen concluded that they had tight joints, when the joints became hot; but after the material was cold, and the heat of the friction was gone, the joints would not be tight. The fact of the matter was that the heat showed conclusively that the threads had not been properly cleaned, and instead of the heat being an evidence of a tight joint, it was evidence of a bad joint, and we have no doubt that there has been, and still is, an enormous amount of pipe line work being botched up in this way.

Some time ago we took occasion to make a test on this question on an eight-inch pipe line to withstand 1,000 pounds of air pressure; and this we did with the regular weight of line pipe and a coupling weighing about 24 pounds—the weight of a first-class line pipe coupling of this size. The result of the experiment on thirty-two joints was that on the first test all were tight, excepting one, and when this joint was taken apart and again made up, it also proved tight.

These cases simply prove that it is a comparatively easy matter to make tight joints for 1,000 pounds air pressure, and with the ordinary pipe line material.

It must be evident to any one who has given any thought whatever to this subject that in order to make good joints, the iron must be brought together as solidly as possible.

To secure this result the first essential is that the threads should be absolutely clean; and the next is that the very best lubricant should be used in order to prevent friction, and they should not be screwed up fast enough to make any change in the temperature of the material.

It is necessary that the threads be cut clean, that is, that taps and dies be in perfect condition.

A taper thread is not absolutely necessary to the making of a tight joint. (In one experiment we made one joint with coupling which had no taper at all, and the others but very little.) Nor is a large amount of bearing necessary to make a tight joint—although for permanency and serviceability the standard length of threads and taper we consider necessary and correct.

We made one joint with a thread reduced to three-eighths of an inch in length and it was tight at 1,500 pounds hydraulic pressure, thus proving that the length of thread is not essential to prevent the stripping of the thread, either from the pipe or from the coupling.

We are satisfied that especially long threads are a detriment to the making of a good joint; for it must stand to reason, that the longer the thread the more tendency to friction, which prevents the iron from coming up close together, not to mention the natural irregularities in the threads acting in the same direction.

This will be better understood if we go to an extreme in the matter. For instance, should we undertake to make a joint on eight inch pipe, with a thread six inches long, the friction and irregularities would be so great that it would be practically impossible to get the requisite thread contact.

It should be understood that absence of heat in pipe or coupling does not mean absence of grit or gum in the threads. Dirty threads may be screwed up very slowly, and thus avoid the heating due to friction, and yet the joint be anything but tight.

DEFECTS IN THREADS

ON WROUGHT IRON OR STEEL PIPE AND FITTINGS

BY. R. T. CRANE

It is surprising what erroneous ideas are held regarding the placing of too much importance on defects in threads of pipe and fittings by those whose business it is to make joints with them.

In order to show how mistaken are these ideas, Crane Co. some time ago made the most searching and conclusive tests, giving abundant evidence that the many defects for which pipe and fittings often are rejected, are entirely unimportant and do not in the slightest militate against the making of a thoroughly tight and serviceable joint.

One of the causes assigned for the rejection of pipe and materials is that the threads are a trifle broken. Probably not so much as one per cent of the whole bearing of the thread is gone, or marred, yet there are steamfitters who will throw out such material.

Crane Co. has shown conclusively, in the following practical way, that it is absurd to discard such material for ordinary defects in threads.

A piece of eight inch pipe was threaded for a distance of two and a quarter inches. This pipe was then put in a lathe and was mutilated, as shown in the accompanying illustration.

In the threaded part three grooves were turned, each $\frac{3}{16}$ of an inch wide and to the bottom of the thread. The top of the remaining threads, with the exception of the one at the end of the pipe, were turned off, giving them a flat surface of $\frac{1}{32}$ of an inch wide.

Next, at three places on the circumference of the tapered thread, flat spots were filed, one inch wide and two inches long, extending one inch on the threaded part.

Twenty-five grooves were than filed in the thread of the pipe and the same number in the coupling, all parallel with the pipe and two-thirds of the depth of the thread.

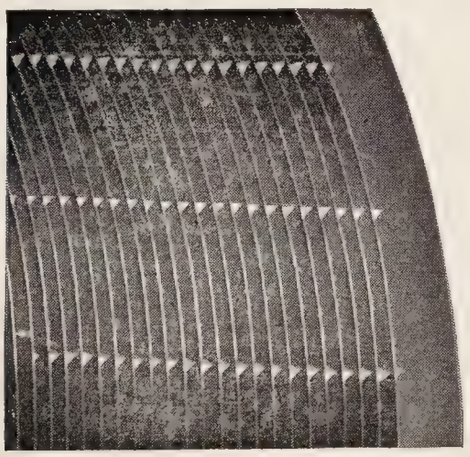
When all this deliberate mutilating was finished, the threads were cleaned thoroughly and coated with "Crane Cement." The joint was then screwed up so that the lengthwise grooves did not come opposite one another.

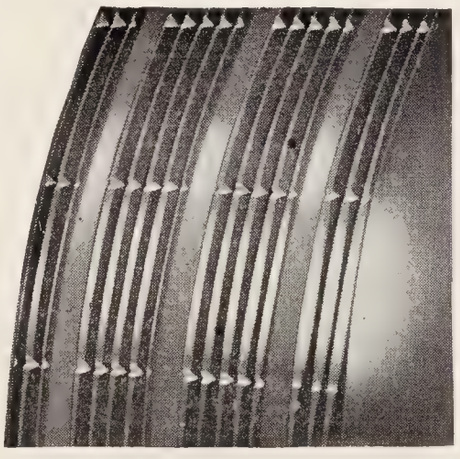
The outer ends of the pipe and coupling next were plugged and the joint was tested to 425 pounds of air pressure. The joint was found to be tight, and the same result followed a hydraulic pressure test of 1000 pounds.

The amount of defect in the thread of this joint was at least one hundred times greater than that for which many regular steamfitters and engineers reject material.

These tests show the amount of ignorance there has been in these matters all these years. Crane Co. reasoned this subject out, and, confident the public held a wrong theory, caused this experiment to be made.

Undoubtedly the amount of material rejected for minor and wholly unimportant defects in the past, must have cost the trade many thousands of dollars.





Note.—The lubricant used when making the foregoing test was "Crane Cement." We have used this preparation for many years, and have not found anything quite so satisfactory for this purpose. It is economical, because the saving in time and annoyance more than balances the small first cost.

AMERICAN STANDARD FOR PIPE THREADS

ALL OUR VALVES AND FITTINGS UP TO AND INCLUDING THE 30-INCH SIZE, ARE TAPPED OR THREADED TO THE AMERICAN STANDARD FOR PIPE THREADS, WHICH HAS BEEN ADOPTED BY ALL THE LEADING WROUGHT PIPE, VALVE AND FITTING MANUFACTURERS IN THE UNITED STATES.

IF TROUBLE IS ENCOUNTERED IN USING CRANE THREADED MATERIAL WITH THAT FROM OTHER SOURCES, IT WILL BE BECAUSE SUCH MATERIAL DOES NOT CONFORM TO THE AMERICAN STANDARD.

LOW PRESSURE CAST IRON FLANGED FITTINGS

FOR STEAM WORKING PRESSURES UP TO 25 POUNDS

FOR WATER WORKING PRESSURES UP TO 50 POUNDS

FLANGED ELBOWS

No. 567

CODE: JUNICULOS

45° FLANGED ELBOWS

No. 569

CODE: JUNTINHOS

FLANGED LONG RADIUS ELBOWS

No. 578

CODE: JURGABARE

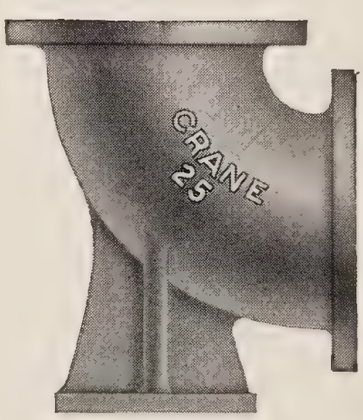
FLANGED SQUARE BASE ELBOWS

No 579

CODE: JURULENTAM

FLANGED BASE TEES MADE TO ORDER

PRICES ON APPLICATION



FLANGED ROUND BASE ELBOWS

No. 580

CODE: JUTERBOG

LOW PRESSURE CAST IRON FLANGED FITTINGS ARE MARKED CRANE 25

All Low Pressure Flanged Fittings have the same dimensions as Standard Flanged Fittings, except the thickness of body.

For further information, see page 421.

LOW PRESSURE CAST IRON FLANGED FITTINGS

FOR STEAM WORKING PRESSURES UP TO 25 POUNDS

FOR WATER WORKING PRESSURES UP TO 50 POUNDS

Size	Size	No. 567, 90° Elbows		No. 569, 45° Elbows	
		Faced	Faced and Drilled	Faced	Faced and Drilled
Inches	Millimeters	Each	Each	Each	Each
16	400	52.00	57.00	52.00	57.00
18	450	67.50	73.50	67.50	73.50
20	500	85.50	92.50	85.50	92.50
22	550	107.00	116.00	107.00	116.00
24	600	133.00	143.00	133.00	143.00
26	650	167.50	180.00	167.50	180.00
28	700	190.00	210.00	190.00	210.00
30	750	225.00	245.00	225.00	245.00
32	800	270.00	290.00	270.00	290.00
34	850	315.00	340.00	315.00	340.00
36	900	360.00	385.00	360.00	385.00

Size	Size	No. 579 or No. 580 Round or Square Base Elbows		
		Faced Except Base Flange	Faced and Drilled Except Base Flange	Facing and Drilling Base Flange
Inches	Millimeters	Each	Each	Each
16	400	85.00	90.00	7.50
18	450	100.00	106.00	12.00
20	500	114.00	121.00	12.00
22	550	142.00	151.00	12 00
24	600	180.00	190.00	12.00

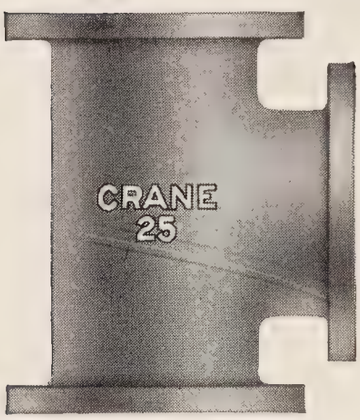
Size	Size	No. 578 Long Radius Elbows		
		Faced	Faced and Drilled	Radius
Inches	Millimeters	Each	Each	Inches
16	400	86.00	93.50	21¼
18	450	113.00	122.00	23⅝
20	500	143.00	153.00	26
22	550	178.00	191.00	28⅜
24	600	222.00	237.00	30¾

Furnished Faced only, unless otherwise ordered.

For general dimensions, see page 652 and 653.
For drilling templates, see page 596.
For dimensions of base elbows, see page 660.

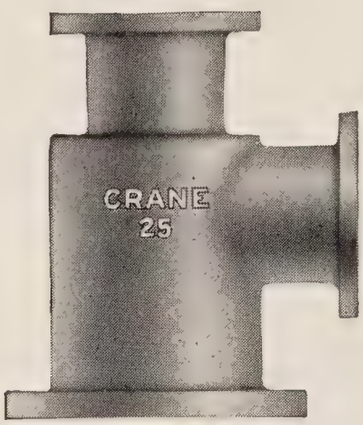
LOW PRESSURE CAST IRON FLANGED TEES

FOR STEAM WORKING PRESSURES UP TO 25 POUNDS
FOR WATER WORKING PRESSURES UP TO 50 POUNDS



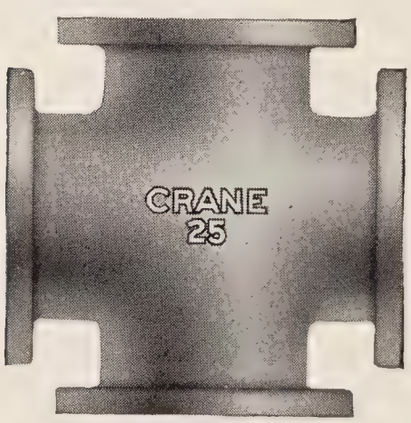
FLANGED TEES
No. 571

CODE: JUVENCORUM



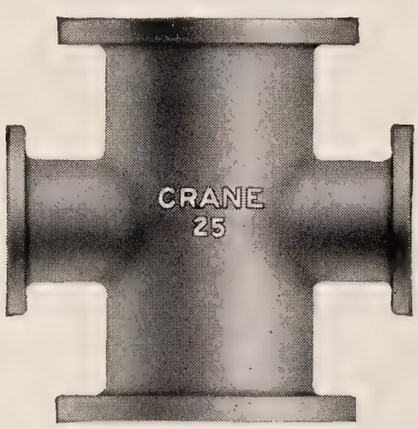
REDUCING FLANGED TEES
REDUCING IN RUN OR BRANCH
No. 573

CODE: KILKROB



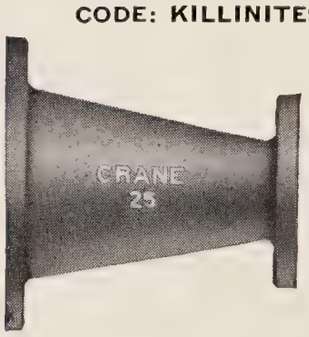
FLANGED CROSSES
No. 575

CODE: KILLINITES



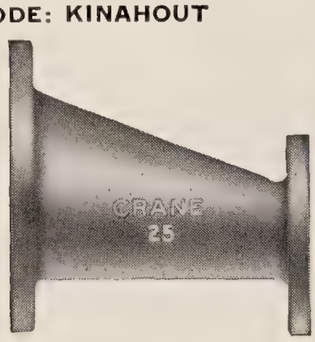
REDUCING FLANGED CROSSES
No. 577

CODE: KINAHOUT



FLANGED
TAPER REDUCERS
No. 581

CODE: KINASTOF



FLANGED ECCENTRIC
TAPER REDUCERS
No. 582

CODE: KINKHUSTEN

LOW PRESSURE CAST IRON FLANGED FITTINGS ARE MARKED CRANE 25

All Low Pressure Flanged Fittings have the same dimensions as Standard Flanged Fittings, except the thickness of body.

For further information, see page 421.

LOW PRESSURE CAST IRON FLANGED FITTINGS

FOR STEAM WORKING PRESSURES UP TO 25 POUNDS

FOR WATER WORKING PRESSURES UP TO 50 POUNDS

Size	Size	No. 571 Tees		No. 573 Reducing Tees		No. 575 Crosses		No. 577 Reducing Crosses	
		Faced	Faced and Drilled	Faced	Faced and Drilled	Faced	Faced and Drilled	Faced	Faced and Drilled
Inches	Millimeters	Each	Each	Each	Each	Each	Each	Each	Each
16	400	75.00	82.50	86.00	93.50	114.00	124.00	130.00	140.00
18	450	98.00	107.00	113.00	122.00	150.00	162.00	172.00	184.00
20	500	123.00	133.00	143.00	153.00	188.00	202.00	217.00	231.00
22	550	155.00	168.00	178.00	191.00	235.00	253.00	270.00	288.00
24	600	193.00	208.00	222.00	237.00	290.00	310.00	335.00	355.00
26	650	243.00	262.00	280.00	299.00	370.00	395.00	425.00	450.00
28	700	275.00	305.00	316.00	346.00	420.00	460.00	480.00	520.00
30	750	325.00	355.00	375.00	405.00	495.00	535.00	565.00	605.00
32	800	392.00	422.00	451.00	481.00	595.00	635.00	685.00	725.00
34	850	457.00	495.00	525.00	563.00	690.00	740.00	795.00	845.00
36	900	520.00	560.00	598.00	638.00	790.00	840.00	910.00	960.00

Reducing Low Pressure Tees and Crosses made to order in all reducing sizes at regular List and Discount.

No. 581 TAPER REDUCERS

Size Inches	Size Millimeters	Faced Only	Faced and Drilled	Size Inches	Size Millimeters	Faced Only	Faced and Drilled
16x12	400x300	85.00	90.00	20x18	500x450	114.00	121.00
16x14	400x350	85.00	90.00	22x15	550x375	142.00	151.00
16x15	400x375	85.00	90.00	22x16	550x400	142.00	151.00
18x12	450x300	100.00	106.00	22x18	550x450	142.00	151.00
18x14	450x350	100.00	106.00	22x20	550x500	142.00	151.00
18x15	450x375	100.00	106.00	24x16	600x400	180.00	190.00
18x16	450x400	100.00	106.00	24x18	600x450	180.00	190.00
20x14	500x350	114.00	121.00	24x20	600x500	180.00	190.00
20x15	500x375	114.00	121.00	24x22	600x550	180.00	190.00
20x16	500x400	114.00	121.00				

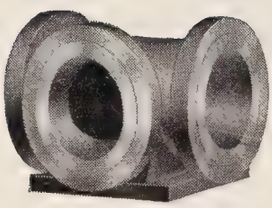
Eccentric Taper Reducers will be made to order only.
Taper Reducers not listed above, will be made to order.
Furnished Faced only unless otherwise ordered.
For general dimensions see pages 652 to 654.
Templates for Drilling, page 596.

SPECIAL FLANGED FITTINGS

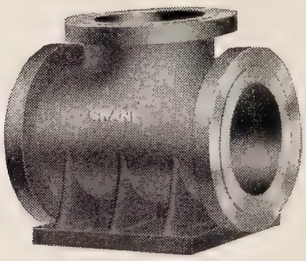
CAST IRON, FERROSTEEL OR CAST STEEL

LOW PRESSURE, STANDARD AND EXTRA HEAVY PATTERNS

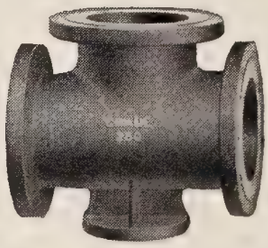
ANCHORAGE AND BASE FITTINGS



ANCHORAGE TEE
OUTLET AT SIDE



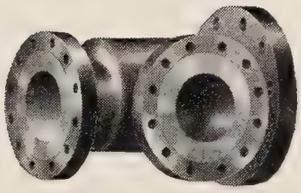
ANCHORAGE TEE
OUTLET AT TOP



BASE TEE

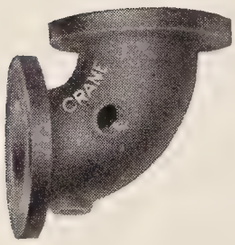
ECCENTRIC FITTINGS

FLANGE
TAPPED ECCENTRIC



ECCENTRIC TEE
ONE END OF RUN, OR BRANCH,
OR BOTH MAY BE ECCENTRIC

FITTINGS WITH TAPPED BOSSES



ELBOW
SHOWING WHERE TAPPED
BOSSES MAY BE LOCATED

TEE
SHOWING WHERE TAPPED
BOSSES MAY BE LOCATED

SPECIAL
ANGLE ELBOWS

RING CLOSING PIECE
FACED ON BOTH SIDES

Beveled Filling Ring Faced on
Both Sides for Closing Up
Between Two Flanges Which
Do Not Face Squarely

PRICES ON APPLICATION

Dimension drawings should accompany orders or inquiries for prices.
See other designs of Special Flanged Fittings, page 459.

STANDARD
FLANGED FITTINGS

EXPLANATORY NOTES ON THE AMERICAN STANDARD

EFFECTIVE JANUARY 1, 1914

All standard weight fittings are recommended for steam working pressures up to 125 pounds, and are marked CRANE 125 For water working pressures, see page 1.

All standard weight fittings and flanges have plain faces.

Bolt holes drilled ⅛-inch larger in diameter than diameter of bolts.

Bolt holes will not be spot faced unless so ordered, for which an extra charge will be made.

Bolt holes straddle center line.

Square head bolts with hexagonal nuts are recommended.

For bolts, 1⅝-inches diameter and larger, studs with a nut on each end are satisfactory.

Hexagonal nuts for pipe sizes 1-inch to 46 inches, can be conveniently pulled up with open wrenches of minimum design of heads. Hexagonal nuts for pipe sizes 48 inches to 100 inches on 125 pound fittings can be conveniently pulled up with box wrenches.

Size of all fittings scheduled indicates inside diameter of ports.

Standard Reducing Elbows carry the same dimensions center to face as regular Elbows of largest straight size.

Angle Elbows and Special Angle Fittings from 1° to 45°, use center to face dimensions given for regular 45° elbows, and fittings over 45°, use center to face dimensions given for regular 90° elbows.

Where long radius fittings are specified, it has reference only to Elbows which are made in two center to face dimensions known as Elbows and Long Radius Elbows, the latter being used only when so specified.

Double Branch Elbows, whether straight or reducing, carry the same dimensions center to face and face to face as regular straight size Elbows and Tees.

Side Outlet Elbows and Side Outlet Tees, whether straight or reducing sizes, carry the same dimensions center to face and face to face as regular Tees having the same reductions.

Bull Head Tees or Tees increasing on outlet, will have same center to face and face to face dimensions as a straight fitting of the size of the outlet.

Double Sweep Tees are not made reducing on the run.

Standard Tees, Crosses and Laterals, reducing on run only, carry same dimensions face to face as largest straight size.

Tees, Crosses and Laterals, 16 inches and smaller, reducing on the outlet or branch use the same dimensions as straight sizes of the larger port.

Fittings size 18 inches and larger, reducing on the outlet or branch are made in two lengths, depending on the size of the outlet as given in the table of dimensions.

The dimensions of reducing flanged fittings always are regulated by the reductions of the outlet or branch. Fittings reducing on the run only, the long body pattern will always be used.

The face to face dimension of Reducers is the same for either straight or eccentric Pattern.

"Y's" are special and are made to suit conditions.

STANDARD CAST IRON FLANGED FITTINGS

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS

FLANGED ELBOWS
No. 525

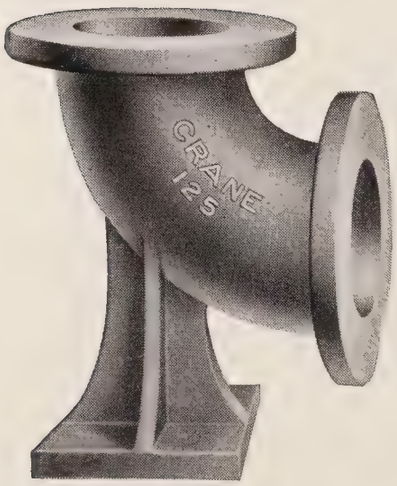
CODE: KITAIBEL

45° FLANGED ELBOWS
No. 527

CODE: KLEBSAME

FLANGED LONG RADIUS ELBOWS
No. 551

CODE: KNOLLHAFER



FLANGED
SQUARE BASE ELBOWS
No. 549

CODE: KLUSBACKEN

FLANGED BASE TEES
MADE TO ORDER

PRICES ON
APPLICATION

FLANGED
ROUND BASE ELBOWS
No. 550

CODE: KNAUTSCHIG

STANDARD CAST IRON FLANGED FITTINGS

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS

Size Inches	Size Millimeters	No. 525 Elbow		No. 527 45° Elbow		No. 551 Long Radius Elbow		
		Faced Each	Faced and Drilled Each	Faced Each	Faced and Drilled Each	Faced Each	Faced and Drilled Each	Radius Inches
1¼	32	3.00	3.60	3.30	3.90			
1½	38	3.00	3.60	3.30	3.90			
2	50	3.00	3.60	3.30	3.90	5.00	5.90	5¼
2½	64	3.15	3.75	3.50	4.10	5.25	6.15	5⅝
3	76	3.45	4.15	3.80	4.50	5.75	6.85	6¼
3½	90	4.05	4.90	4.50	5.35	6.75	8.00	6⅞
4	100	4.50	5.50	5.00	6.00	7.50	9.00	7⅜
4½	113	5.50	6.50	6.00	7.00	9.25	10.75	7¾
5	125	6.25	7.25	6.90	7.90	10.50	12.00	8½
6	150	7.60	8.90	8.35	9.65	12.65	14.60	9⅝
7	175	10.50	12.00	11.00	12.50	17.50	19.75	10⅞
8	200	12.00	13.60	12.60	14.20	20.00	22.40	12
9	225	17.00	19.25	17.75	20.00	28.50	31.85	13
10	250	19.00	21.70	20.00	22.70	31.50	35.50	14⅛
12	300	28.00	31.00	29.50	32.50	46.50	51.00	16½
14	350	41.50	45.25	41.50	45.25	69.00	74.50	18⅞
15	375	47.00	51.50	47.00	51.50	78.00	84.75	20
16	400	54.50	59.50	54.50	59.50	91.00	98.50	21¼
18	450	71.00	77.00	71.00	77.00	118.00	127.00	23⅝
20	500	90.00	97.00	90.00	97.00	150.00	160.00	26
22	550	113.00	122.00	113.00	122.00			
24	600	140.00	150.00	140.00	150.00			

Size Inches	Size Millimeters	No. 549 or No. 550 Base Elbows		
		Faced, Except Base Flange Each	Faced and Drilled Except Base Flange Each	Facing and Drilling Base Flange Each
4	100	9.00	10.00	3.00
4½	113	11.00	12.00	3.00
5	125	12.50	13.50	3.50
6	150	15.25	16.55	3.50
7	175	21.00	22.50	3.50
8	200	24.00	25.60	5.00
9	225	34.00	36.25	5.00
10	250	38.00	40.70	5.00
12	300	56.00	59.00	7.50
14	350	70.00	73.75	7.50
15	375	80.00	84.50	7.50
16	400	90.00	95.00	7.50
18	450	105.00	111.00	12.00

All fittings furnished faced only unless otherwise ordered.

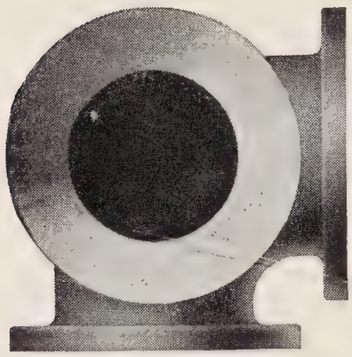
For dimension of Base Flanges of Base Elbows see page 660.

For general dimensions, see pages 652 and 653.

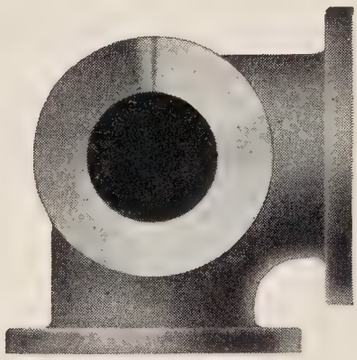
Templates for Drilling, page 596.

STANDARD CAST IRON FLANGED FITTINGS

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS



SIDE OUTLET FLANGED ELBOWS
No. 526
CODE: KOHLBARM



REDUCING SIDE OUTLET FLANGED ELBOWS
No. 528
CODE: KOLOMTITEL

Side Outlet Elbows are furnished with all openings on intersecting center lines.

FLANGED TAPER REDUCING ELBOWS
No. 545
CODE: KONTOBUCH

DOUBLE BRANCH FLANGED ELBOWS
No. 538
CODE: KOLOTOME

REDUCING DOUBLE BRANCH FLANGED ELBOWS
No. 540
CODE: KONSONANZ

When ordering either Side Outlet Elbows or Double Branch Elbows it is requested that a sketch be submitted showing exact size of all openings.

Double Branch Elbows having branches of two different sizes or reducing on inlet are considered special and are made to order only and at a special price.

STANDARD CAST IRON FLANGED FITTINGS

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS

Size	Size	No. 545 Taper Elbows		Size	Size	No. 545 Taper Elbows	
		Faced	Faced and Drilled			Faced	Faced and Drilled
Inches	Millimeters	Each	Each	Inches	Millimeters	Each	Each
2½x2	64x50	6.30	6.90	8x5	200x125	24.00	25.60
3x1½	76x38	6.90	7.60	8x6	200x150	24.00	25.60
3x2	76x50	6.90	7.60	8x7	200x175	24.00	25.60
3x2½	76x64	6.90	7.60	9x6	225x150	34.00	36.25
3½x2	90x50	8.10	8.95	9x8	225x200	34.00	36.25
3½x2½	90x64	8.10	8.95	10x4½	250x113	38.00	40.70
3½x3	90x76	8.10	8.95	10x5	250x125	38.00	40.70
4x2	100x50	9.00	10.00	10x6	250x150	38.00	40.70
4x2½	100x64	9.00	10.00	10x7	250x175	38.00	40.70
4x3	100x76	9.00	10.00	10x8	250x200	38.00	40.70
4x3½	100x90	9.00	10.00	10x9	250x225	38.00	40.70
4½x2½	113x64	11.00	12.00	12x6	300x150	56.00	59.00
4½3½	113x90	11.00	12.00	12x7	300x175	56.00	59.00
4½x4	113x100	11.00	12.00	12x8	300x200	56.00	59.00
5x2½	125x64	12.50	13.50	12x10	300x250	56.00	59.00
5x3	125x76	12.50	13.50	14x10	350x250	70.00	73.75
5x4	125x100	12.50	13.50	14x12	350x300	70.00	73.75
6x2½	150x64	15.25	16.55	15x10	375x250	80.00	84.50
6x3	150x76	15.25	16.55	15x12	375x300	80.00	84.50
6x3½	150x90	15.25	16.55	16x12	400x300	90.00	95.00
6x4	150x100	15.25	16.55	16x14	400x350	90.00	95.00
6x5	150x125	15.25	16.55	16x15	400x375	90.00	95.00
7x5	175x125	21.00	22.50	18x15	450x375	105.00	111.00
7x6	175x150	21.00	22.50	18x16	450x400	105.00	111.00
8x3	200x76	24.00	25.60	20x14	500x350	120.00	127.00
8x3½	200x90	24.00	25.60	20x16	500x400	120.00	127.00
8x4	200x100	24.00	25.60	20x18	500x450	120.00	127.00

Size	Size	No. 538 Double Branch Elbows		No. 540 Reducing Double Branch Elbows		No. 526 Side Outlet Elbows		No. 528 Reducing Side Outlet Elbows	
		Faced	Faced and Drilled,	Faced	Faced and Drilled,	Faced	Faced and Drilled,	Faced	Faced and Drilled,
Inches	Milli-meters	Each	Each	Each	Each	Each	Each	Each	Each
4	100	28.50	30.00	31.50	33.00	26.50	28.00	29.50	31.00
5	125	36.00	37.50	39.50	41.00	28.50	30.00	31.50	33.00
6	150	38.00	40.00	42.00	44.00	33.00	35.00	36.00	38.00
7	175	42.75	45.00	47.75	50.00	40.25	42.50	44.75	47.00
8	200	47.50	50.00	52.50	55.00	47.50	50.00	52.50	55.00
10	250	66.00	70.00	73.50	77.50	76.00	80.00	84.00	88.00
12	300	90.50	95.00	100.50	105.00	100.50	105.00	110.50	115.00
14	350	119.50	125.00	132.50	138.00	129.50	135.00	144.50	150.00
16	400	142.50	150.00	157.50	165.00	152.50	160.00	167.50	175.00

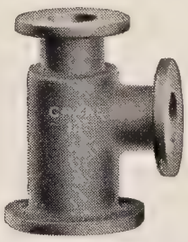
Larger sizes made to order. Prices on application.
Furnished faced only unless otherwise ordered.
For general dimensions, see pages 652 and 653.
Templates for drilling, page 596.

STANDARD CAST IRON FLANGED FITTINGS

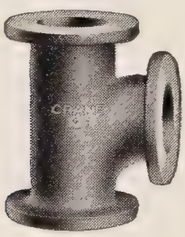
FOR STEAM WORKING PRESSURES UP TO 125 POUNDS

FLANGED TEES

No. 529
CODE: KRUITZAKJE



REDUCING FLANGED TEES
REDUCING IN RUN OR BRANCH
No. 531
CODE: LABIDANO



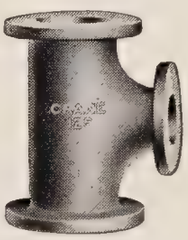
SINGLE SWEEP FLANGED TEES

No. 533
CODE: LAUDABAMUS

REDUCING
SINGLE SWEEP FLANGED TEES
REDUCING IN RUN OR BRANCH
No. 535
CODE: LAUGASCHE

We do not make Single Sweep Tees with side openings larger than the run.

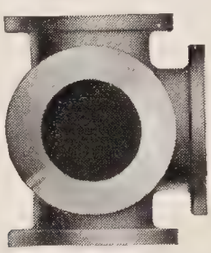
DOUBLE SWEEP FLANGED TEES
No. 534
CODE: LAUSABATIS



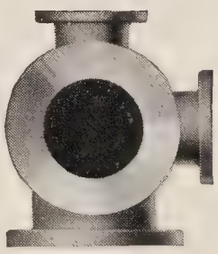
REDUCING
DOUBLE SWEEP FLANGED TEES
No. 536
CODE: LAVATIVAS

Double Sweep Tees are not made reducing on the run. Should such Tees, however, be wanted we will alter patterns and change the dimensions (which will be expensive) and furnish at a special price. Dimensions on request.

We can only increase branch (outlet) within a reasonable limit, which must be regulated by our patterns.



FLANGED
SIDE OUTLET TEES
No. 530
CODE: LEBEHOCH



REDUCING
SIDE OUTLET FLANGED TEES
No. 532
CODE: LEBRESINHA

When ordering Side Outlet Tees it is requested that a sketch be submitted showing exact size of all openings.

STANDARD CAST IRON FLANGED FITTINGS

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS

Size	Size	No. 529 Tees		No. 531 Reducing Tees		No. 533 Single Sweep; No. 534 Double Sweep Straight Tees		No. 535 Single Sweep; No. 536 Double Sweep Reducing Tees	
Inches	Milli-meters	Faced Each	Faced and Drilled	Faced Each	Faced and Drilled	Faced Each	Faced and Drilled	Faced Each	Faced and Drilled
1¼	32	4.35	5.25						
1½	38	4.35	5.25	5.00	5.90				
2	50	4.35	5.25	5.00	5.90	5.00	5.90		
2½	64	4.55	5.45	5.25	6.15	5.25	6.15	6.00	6.90
3	76	5.00	6.10	5.75	6.85	5.75	6.85	6.60	7.70
3½	90	5.85	7.10	6.75	8.00	6.75	8.00	7.75	9.00
4	100	6.50	8.00	7.50	9.00	7.50	9.00	8.65	10.15
4½	113	8.00	9.50	9.25	10.75	9.25	10.75	10.60	12.10
5	125	9.10	10.60	10.50	12.00	10.50	12.00	12.00	13.50
6	150	11.00	12.95	12.65	14.60	12.65	14.60	14.50	16.45
7	175	15.25	17.50	17.50	19.75	17.50	19.75	20.00	22.25
8	200	17.40	19.80	20.00	22.40	20.00	22.40	23.00	25.40
9	225	24.65	28.00	28.50	31.85	28.50	31.85	32.75	36.10
10	250	27.50	31.50	31.50	35.50	31.50	35.50	36.00	40.00
12	300	40.50	45.00	46.50	51.00	46.50	51.00	53.50	58.00
14	350	60.00	65.50	69.00	74.50	69.00	74.50	79.00	84.50
15	375	68.00	74.75	78.00	84.75	78.00	84.75	90.00	96.75
16	400	79.00	86.50	91.00	98.50	91.00	98.50	105.00	112.50
18	450	103.00	112.00	118.00	127.00				
20	500	130.00	140.00	150.00	160.00				
22	550	164.00	177.00	189.00	202.00				
24	600	203.00	218.00	233.00	248.00				

See page 718 for advanced prices beyond regular list and discount on Reducing Flanged Tees not carried in stock.

For list of reducing sizes carried in stock, see pages 717 and 718.

REDUCING FLANGED TEES

An assortment of Reducing Flanged Tees, No. 531, is carried in stock as per list on pages 717 and 718. To overcome the delay in filling orders for such sizes as are not carried in stock,we can use the Reducing Flanges with ribs as per illustration and note on page 716, if desired by the customer.

Size	Size	No. 530 Side Outlet Tees		No. 532 Reducing Side Outlet Tees	
Inches	Millimeter	Faced Each	Faced and Drilled Each	Faced Each	Faced and Drilled, Each
4	100	31.00	33.00	34.00	36.00
5	125	35.00	37.00	39.00	41.00
6	150	42.25	45.00	47.25	50.00
7	175	49.50	52.50	55.00	58.00
8	200	56.75	60.00	62.75	66.00
10	250	84.50	90.00	94.50	100.00
12	300	114.00	120.00	126.00	132.00
14	350	142.50	150.00	157.50	165.00
16	400	170.00	180.00	190.00	200.00

Furnished faced only unless otherwise ordered.

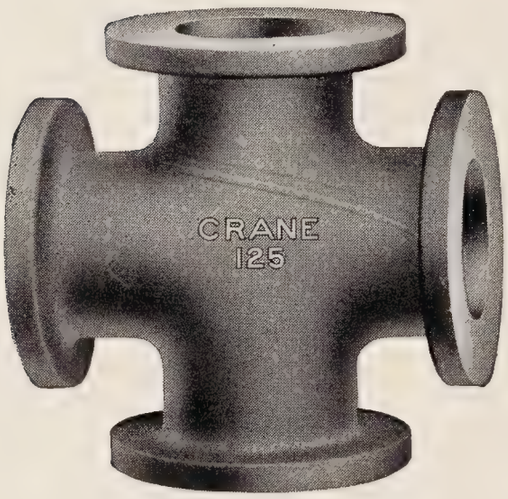
For general dimensions, see pages 652 to 654.

Templates for drilling, see page 596.

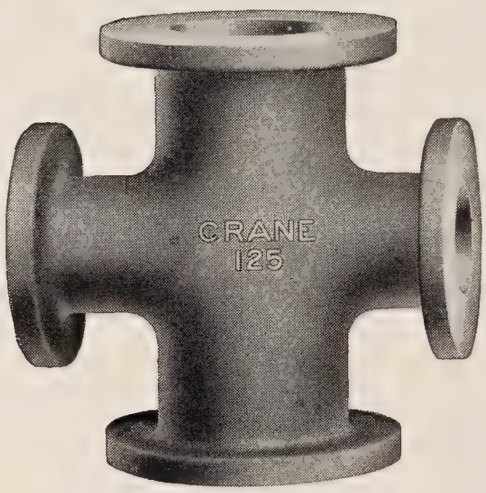
STANDARD CAST IRON

FLANGED FITTINGS

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS



FLANGED CROSSES
No. 537
CODE: LECANANTHE



REDUCING FLANGED CROSSES
No. 539
CODE: LEGIFERAT

45° FLANGED LATERALS
No. 541
CODE: LEHENTAXE

REDUCING 45° FLANGED LATERALS
REDUCING IN RUN OR BRANCH
No. 543
CODE: LEMODIPODA

STANDARD CAST IRON

FLANGED FITTINGS

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS

Size	Size	No. 537 Cross		No. 539 Reducing Cross		No. 541 45° Lateral		No. 543 Reducing 45° Lateral	
		Faced	Faced and Drilled	Faced	Faced and Drilled	Faced	Faced and Drilled	Faced	Faced and Drilled
Inches	Millimeters	Each	Each	Each	Each	Each	Each	Each	Each
1¼	32	6.75	7.95						
1½	38	6.75	7.95						
2	50	6.75	7.95	7.75	8.95	6.75	7.95		
2½	64	6.95	8.15	8.00	9.20	6.95	8.15	8.00	9.20
3	76	7.65	9.05	8.75	10.15	7.65	9.05	8.75	10.15
3½	90	9.00	10.70	10.35	12.05	9.00	10.70	10.35	12.05
4	100	10.00	12.00	11.50	13.50	10.00	12.00	11.50	13.50
4½	113	12.00	14.00	13.75	15.75	12.00	14.00	13.75	15.75
5	125	13.75	15.75	15.75	17.75	13.75	15.75	15.75	17.75
6	150	16.75	19.25	19.25	21.75	16.75	19.25	19.25	21.75
7	175	23.00	26.00	26.50	29.50	23.00	26.00	26.50	29.50
8	200	26.50	29.75	30.50	33.75	26.50	29.75	30.50	33.75
9	225	37.50	42.00	43.00	47.50	37.50	42.00	43.00	47.50
10	250	42.00	47.50	48.00	53.50	42.00	47.50	48.00	53.50
12	300	61.50	67.50	71.00	77.00	61.50	67.50	71.00	77.00
14	350	91.00	98.50	105.00	112.50	91.00	98.50	105.00	112.50
15	375	103.00	112.00	118.00	127.00	103.00	112.00	118.00	127.00
16	400	120.00	130.00	138.00	148.00	120.00	130.00	138.00	148.00
18	450	157.00	169.00	180.00	192.00				
20	500	198.00	212.00	228.00	242.00				
22	550	248.00	266.00	285.00	303.00				
24	600	310.00	330.00	355.00	375.00				

Larger sizes made to order only. Prices on application.

Furnished faced only, unless otherwise ordered.

See page 718 for advanced prices beyond regular list and discount on Reducing Flanged Laterals and Crosses not carried in stock.

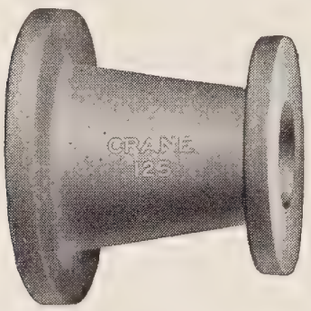
For list of reducing sizes carried in stock, see page 718.

For general dimensions, see pages 652 to 655.

For drilling templates, see page 596.

STANDARD CAST IRON FLANGED TAPER REDUCERS

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS



FLANGED TAPER REDUCERS
No. 547
CODE: LENNLOSE

FLANGED ECCENTRIC TAPER REDUCERS No. 548
CODE: LEUNINKJES
PRICES ON APPLICATION

Size	Size	No. 547		Size	Size	No. 547	
		Faced	Faced and Drilled,			Faced	Faced and drilled
Inches	Millimeters	Each	Each	Inches	Millimeters	Each	Each
3x2	76x50	6.90	7.60	14x6	350x150	70.00	73.75
3½x2½	90x64	8.10	8.95	14x8	350x200	70.00	73.75
4x2	100x50	9.00	10.00	14x10	350x250	70.00	73.75
4x2½	100x64	9.00	10.00	14x12	350x300	70.00	73.75
4x3	100x76	9.00	10.00	15x8	375x200	80.00	84.50
5x2	125x50	12.50	13.50	15x10	375x250	80.00	84.50
5x2½	125x64	12.50	13.50	15x12	375x300	80.00	84.50
5x3	125x76	12.50	13.50	15x14	375x350	80.00	84.50
5x4	125x100	12.50	13.50	16x8	400x200	90.00	95.00
6x3	150x76	15.25	16.55	16x10	400x250	90.00	95.00
6x3½	150x90	15.25	16.55	16x12	400x300	90.00	95.00
6x4	150x100	15.25	16.55	16x14	400x350	90.00	95.00
6x5	150x125	15.25	16.55	18x10	450x250	105.00	111.00
7x3	175x76	21.00	22.50	18x12	450x300	105.00	111.00
7x4	175x100	21.00	22.50	18x14	450x350	105.00	111.00
7x5	175x125	21.00	22.50	18x16	450x400	105.00	111.00
7x6	175x150	21.00	22.50	20x12	500x300	120.00	127.00
8x3	200x76	24.00	25.60	20x14	500x350	120.00	127.00
8x4	200x100	24.00	25.60	20x16	500x400	120.00	127.00
8x5	200x125	24.00	25.60	20x18	500x450	120.00	127.00
8x6	200x150	24.00	25.60	22x14	550x350	150.00	159.00
10x4	250x100	38.00	40.70	22x16	550x400	150.00	159.00
10x5	250x125	38.00	40.70	22x18	550x450	150.00	159.00
10x6	250x150	38.00	40.70	22x20	550x500	150.00	159.00
10x8	250x200	38.00	40.70	24x16	600x400	190.00	200.00
12x5	300x125	56.00	59.00	24x18	600x450	190.00	200.00
12x6	300x150	56.00	59.00	24x20	600x500	190.00	200.00
12x8	300x200	56.00	59.00	24x22	600x550	190.00	200.00
12x10	300x250	56.00	59.00				

Flanged Taper Reducers of any other dimensions will be made to order at a special price.

For general dimensions, see pages 652 to 653. For drilling templates, see page 596.

EXTRA PRICE FOR GALVANIZING

STANDARD FLANGED FITTINGS AND FLANGES

Galvanized Standard Cast Iron or Ferrosteel Flanged Fittings will be made to order at an advance over the black price as below:

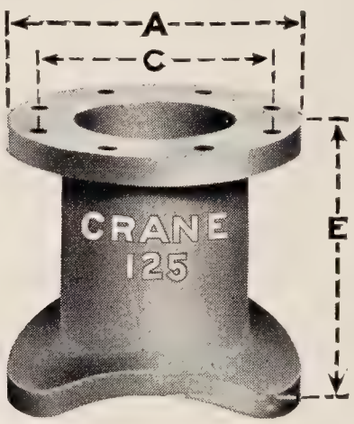
Size	Size	No. 525 Flanged Elbows No. 545 Reducing Flanged Elbows No. 527 Flanged 45° Elbows No. 547 Flanged Taper Reducers	Nos. 529, 531, 533, 534, 535, 536 Flanged Tees and Flanged Reducing Tees Nos. 549, 550 Flanged Base Elbows No. 551 Flanged Long Radius Elbows	Nos. 537, 539 Flanged Crosses and Flanged Reducing Crosses Nos. 541, 543 Flanged Laterals and Flanged Reducing Laterals	Nos. 553, 558 Companion Flanges	No. 557 Reducing Companion Flanges No. 555 Blind Flanges	
Inches	Millimeters	Extra, Each	Extra, Each	Extra, Each	Extra, Each	Diameter Inches	Extra, Each
1¼	32	2.40	3.60	4.80	.60		
1½	38	2.40	3.60	4.80	.60		
2	50	2.40	3.60	4.80	.70	6	1.00
2½	64	2.50	3.75	5.00	.75	7	1.10
3	76	2.75	4.15	5.50	.85	7½	1.25
3½	90	3.25	4.90	6.50	1.00	8½	1.50
4	100	3.65	5.50	7.25	1.20	9	1.80
4½	113	4.35	6.50	8.75	1.25	9¼	1.90
5	125	4.85	7.25	9.75	1.35	10	2.00
6	150	6.00	9.00	12.00	1.65	11	2.50
7	175	8.00	12.00	16.00	2.15	12½	3.25
8	200	9.00	13.50	18.00	2.50	13½	3.75
9	225	13.00	19.50	26.00	3.00	15	4.50
10	250	14.50	22.00	29.00	3.75	16	5.75
12	300	21.00	31.00	42.00	5.00	19	7.50
14	350	30.00	45.00	60.00	7.00	21	10.50
15	375	35.00	52.50	70.00	9.00	22¼	13.50
16	400	40.00	60.00	80.00	10.50	23½	16.00

STANDARD

FLANGED SADDLE NOZZLES

CAST IRON, FERROSTEEL OR CAST STEEL

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS



No. 552

CODE: LIJFGEWELD

DIMENSIONS FOR SINGLE, DOUBLE OR STAGGERED RIVETING

Size of Nozzle	Inches	2	2½	3	3½	4	4½	5
Size	Millimeters	50	64	76	90	100	113	125
A—Diameter of Flat Flange	Inches	6	7	7½	8½	9	9¼	10
Number of Bolts in Flat Flange		4	4	4	4	8	8	8
Size of Bolts	Inches	⅝	⅝	⅝	⅝	⅝	¾	¾
C—Bolt Circle	Inches	4¾	5½	6	7	7½	7¾	8½
E—Height, Face to Face	Inches	7½	7½	7½	7½	7½	8	8
Smallest Diameter can be applied to	Inches	8⅝	8⅝	8⅝	8⅝	8⅝	8⅝	8⅝
Size of Nozzle	Inches	6	7	8	9	10	12	
Size	Millimeters	150	175	200	225	250	300	
A—Diameter of Flat Flange	Inches	11	12½	13½	15	16	19	
Number of Bolts in Flat Flange		8	8	8	12	12	12	
Size of Bolts	Inches	¾	¾	¾	¾	⅞	⅞	
C—Bolt Circle	Inches	9½	10¾	11¾	13¼	14¼	17	
E—Height, Face to Face	Inches	8½	9	9½	10	11	12	
Smallest Diameter can be applied to	Inches	9⅝	10¾	12¾	14	15	16	

Orders and inquiries should state size of Saddle Nozzle, also the diameter of pipe or circle to which it is to be applied.

Also specify whether wanted drilled for single, double or staggered riveting, giving pitch, spacing and the size of rivets.

In ordering to facilitate drilling and riveting, the bottom flange is made oblong.

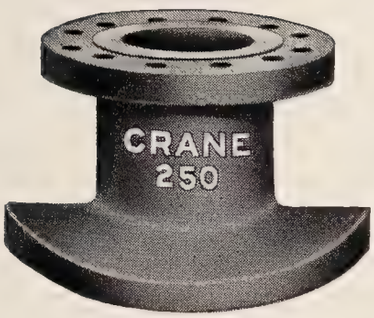
PRICES ON APPLICATION

EXTRA HEAVY

FLANGED SADDLE NOZZLES

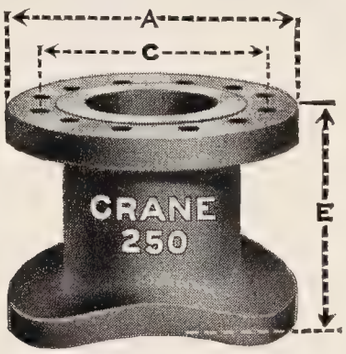
CAST IRON, FERROSTEEL OR CAST STEEL

FOR STEAM WORKING PRESSURES UP TO 250 POUNDS



No. 149 E

CODE: LIJMSTANG



DIMENSIONS FOR SINGLE, DOUBLE OR STAGGERED RIVETING

Size of Nozzle.....Inches	2	2½	3	3½	4	4½	5	6	7	8
Size.....Millimeters	50	64	76	90	100	113	125	150	175	200
A—Diam. of Flat Flange..In.	6½	7½	8¼	9	10	10½	11	12½	14	15
Number of Bolts in Flange...	4	4	8	8	8	8	8	12	12	12
Size of Bolts.....Inches	⅝	¾	¾	¾	¾	¾	¾	¾	⅞	⅞
C—Bolt Circle.....Inches	5	5⅞	6⅝	7¼	7⅞	8½	9¼	10⅝	11⅞	13
E—Height, Face to Face In.	7½	7½	7½	7½	7½	8	8	8½	9	9½
Smallest Diameter Can Be Applied to...In.	8⅝	8⅝	8⅝	9⅝	10¾	12¾	14	14	15	16
Size of Nozzle.....Inches	9	10	12	14	15	16	18	20	22	24
Size.....Millimeters	225	250	300	350	375	400	450	500	550	600
A—Diam. of Flat Flange In.	16¼	17½	20½	23	24½	25½	28	30½	33	36
Number of Bolts in Flange...	12	16	16	20	20	20	24	24	24	24
Size of Bolts.....Inches	1	1	1⅛	1⅛	1¼	1¼	1¼	1⅜	1½	1⅝
C—Bolt Circle.....Inches	14	15¼	17¾	20¼	21½	22½	24¾	27	29¼	32
E—Height, Face to Face, In.	10	11	12	13	13	13½	14	15	15½	16
Smallest Diameter Can Be Applied to...In.	18	18	20	24	24	26	30	32	36	36

Orders and inquiries should state size of Saddle Nozzles, also the diameter of pipe or circle to which it is to be applied.

Also specify whether wanted drilled for single, double or staggered riveting, giving pitch, spacing and the size of rivets.

When Nozzles are wanted to comply with marine requirements, orders should so state.

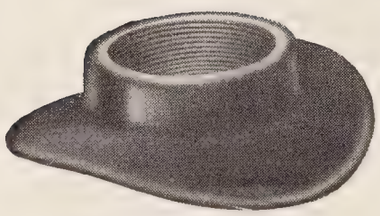
In order to facilitate drilling and riveting, the bottom flange is made oblong.

PRICES ON APPLICATION

EXTRA HEAVY, FORGED STEEL

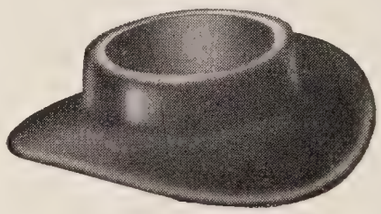
SADDLE OR BOILER FLANGES

FOR STEAM WORKING PRESSURE UP TO 250 POUNDS



No. 299 E

CODE: LIMITALIUM



Size of Pipe Inches	Size of Pipe Milli-meters	Approximate Diameter of Flange Inches	Approximate Thickness of Flange Inches	Depth of Flange Inches	Price, Bent or Flat, not Threaded	Price, Bent or Flat, and Threaded
¾	19	6	5/16	1	2.28	2.40
1	25	6	5/16	1	2.28	2.40
1¼	32	6½	5/16	1	2.28	2.40
1½	38	7	3/8	1¼	2.28	2.40
2	50	8	3/8	1½	2.35	2.50
2½	64	8½	3/8	1½	2.45	2.60
3	76	9	3/8	1½	2.65	2.80
3½	90	9½	7/16	1½	3.00	3.20
4	100	10	7/16	2	3.35	3.50
4½	113	10½	½	2	4.00	4.20
5	125	11½	½	2	4.75	5.00
6	150	12½	½	2	5.70	6.00
7	175	14	5/8	2½	8.60	9.00
8	200	15	5/8	2½	11.40	12.00
9	225	16¼	¾	2½	27.00	30.00
10	250	17½	¾	2½	32.00	35.00
12	300	20	13/16	2½	46.00	50 00

These Flanges have sufficient depth to permit bending them to any reasonable small diameter and still retain sufficient depth of thread to insure a perfectly tight joint.

Special Flanges less than 18-inch circle and up to 8-inch pipe, add 50 per cent to the above list prices.

Flanges for 8-inch pipe bent to a circle less than 18 inches and not less than 10 inches, will be double the above list.

Flanges for 9, 10 and 12-inch pipe, when bent to less than 48-inch circle, and not less than 24-inch circle, add 50 per cent to above list prices.

Flanges for 8-inch pipe and larger, when bent to circles less than those mentioned above, special prices will be quoted on receipt of specifications.

Also specify whether wanted drilled for single, double or staggered riveting, giving pitch, spacing and size of rivets.

EXTRA HEAVY
FLANGED FITTINGS
EXPLANATORY NOTES ON THE AMERICAN STANDARD
EFFECTIVE JANUARY 1, 1914

All Extra Heavy Cast Iron Flanged Fittings are recommended for Saturated Steam Working Pressures up to 250 pounds, and all Extra Heavy Ferrosteel Flanged Fittings are recommended for Saturated or Superheated Steam Pressures up to 250 pounds with a total temperature not exceeding 500° Fahrenheit. For Water Working Pressures, see Page 1.

All Extra Heavy Cast Iron and Ferrosteel Flanged Fittings are marked CRANE 250

All Ferrosteel Fittings have the letters "F. S." cast on to distinguish the Cast Iron from the Ferrosteel Fittings.

All Extra Heavy Ferrosteel Flanged Fittings, except Laterals, are tested to 800 pounds hydraulic pressure. Laterals are tested to 600 pounds hydraulic pressure.

All Extra Heavy Fittings and Flanges have a raised surface, for gaskets, 1/16-inch high inside of bolt holes.

The Bolt Holes are drilled 1/8-inch larger than the diameter of the bolts and straddle the center line.

The Bolt Holes on Extra Heavy Cast Iron and Ferrosteel Flanged Fittings will not be spot faced unless so ordered, for which an extra charge will be made.

All Extra Heavy Flanged Fittings ordered to comply with the A. S. M. E. Boiler Code are furnished spot faced.

Square head bolts with hexagonal nuts are recommended.

For Bolts 1 5/8 inches diameter and larger, studs with a nut on each end are satisfactory.

Hexagonal Nuts for pipe sizes 1-inch to 16 inches can be conveniently pulled up with open wrenches of minimum design of heads.

Hexagonal Nuts for pipe sizes 18 inches to 48 inches can be conveniently pulled up with box wrenches.

Extra Heavy Reducing Elbows carry the same dimensions center to face as regular Elbows of largest straight size.

Angle Elbows and Special Angle Fittings from 1° to 45°, use center to face dimensions given for regular 45° Elbows, and Fittings over 45°, use center to face dimensions given for regular 90° Elbows.

Where Long Radius Fittings are specified, it has reference only to Elbows which are made in two center to face dimensions known as Elbows and Long Radius Elbows, the latter being used only when so specified.

Double Branch Elbows, whether straight or reducing, carry same dimensions center to face and face to face as regular straight size Elbows and Tees.

Side Outlet Elbows and Side Outlet Tees, whether straight or reducing sizes, carry the same dimensions center to face and face to face as regular Tees having same reductions.

Bull Head Tees or Tees increasing on outlet will have the same center to face and face to face dimensions as a straight fitting of the size of the outlet.

Double sweep Tees are not made reducing on the run.

Extra Heavy Tees, Crosses and Laterals, reducing on the run only, carry same dimensions face to face as largest straight size.

Tees, Crosses and Laterals 16 inches and smaller, reducing on the outlet or branch, use the same dimensions as straight sizes of the larger port.

Fittings 18 inches and larger, reducing on the outlet or branch, are made in two lengths depending on the size of the outlet as given in the table of dimensions.

The dimensions of reducing flanged fittings are always regulated by the reductions of the outlet or branch. Fittings reducing on the run only, the long body pattern will always be used.

The face to face dimension of Reducers is the same for either straight or eccentric pattern.

"Y's" are special and are made to suit conditions.

EXTRA HEAVY FLANGED FITTINGS

Tests were made to determine the ultimate strength of Crane Extra Heavy Flanged Fittings, with results as covered in the following table:

EXTRA HEAVY FITTINGS—TEES

Size Inches	Body Metal, Inches	Burst Ferro-steel, pounds per square inch	Average	Burst Cast Iron, pounds per square inch	Average
6	3/4	2,700	....	....	....
6	3/4	2,500	....	1,675	....
6	3/4	3,000	2,733	1,700	1,687
8	13/16	2,100	....	....	....
8	13/16	2,250	....	....	....
8	13/16	2,250	....	....	....
8	13/16	2,100	....	....	....
8	13/16	2,500	....	1,200	....
8	13/16	2,300	2,250	1,500	1,350
10	15/16	2,200	....	....	....
10	15/16	2,200	....	1,225	....
10	15/16	2,100	....	1,300	....
10	15/16	2,000	....	1,200	....
10	15/16	2,300	2,160	1,500	1,306
12	1	2,200	....	....	....
12	1	2,100	....	1,100	....
12	1	2,000	....	1,400	....
12	1	2,000	....	1,500	....
12	1	2,100	....	1,450	....
12	1	1,800	2,033	1,450	1,380
14	1 1/8	1,900	....	....	....
14	1 1/8	1,750	1,825	1,100	1,100
16	1 3/16	1,700	....	1,050	....
16	1 3/16	1,700	1,700	1,000	1,025
18	1 1/4	1,600	....	....	....
18	1 1/4	1,300	1,450	600	600
20	1 5/16	1,400	....	....	....
20	1 5/16	1,150	1,275	750	750
24	1 1/2	1,300	1,300	700	700

EXTRA HEAVY FITTINGS—ELBOWS

Size Inches	Body Metal, Inches	Burst Ferro-steel, pounds per square inch	Average	Burst Cast Iron, pounds per square inch	Average
6	3/4	2,800	....	....	....
6	3/4	3,500	....	2,350	....
6	3/4	3,500	3,266	2,200	2,275
8	13/16	2,700	....	1,700	....
8	13/16	2,800	....	1,600	....
8	13/16	2,800	....	1,500	....
8	13/16	2,600	2,725	1,700	1,625
10	15/16	2,550	....	1,625	....
10	15/16	2,000	....	1,400	....
10	15/16	2,500	2,350	1,600	1,541
12	1	2,000	....	1,275	....
12	1	2,200	....	*900	....
12	1	2,200	2,133	*700	1,275
14	1 1/8	1,700	....	900	....
14	1 1/8	.....	....	1,250	1,075
16	1 3/16	2,100	....	1,250	1,250

*Defective, eliminated from total.

Average of all averages, bursting pressure per square inch:—

Ferrosteel, 2,066 pounds per fitting.

Cast iron, 1,263 pounds per fitting.

Ferrosteel fittings show stronger than cast iron by 63.70 per cent.

Ferrosteel bars show stronger than cast iron bars by 50 per cent.

For the purpose of more accurate comparison between the bursting point of fittings and the tensile strength of test bars cast at the same time, a few examples of 12-inch extra heavy tees are given.

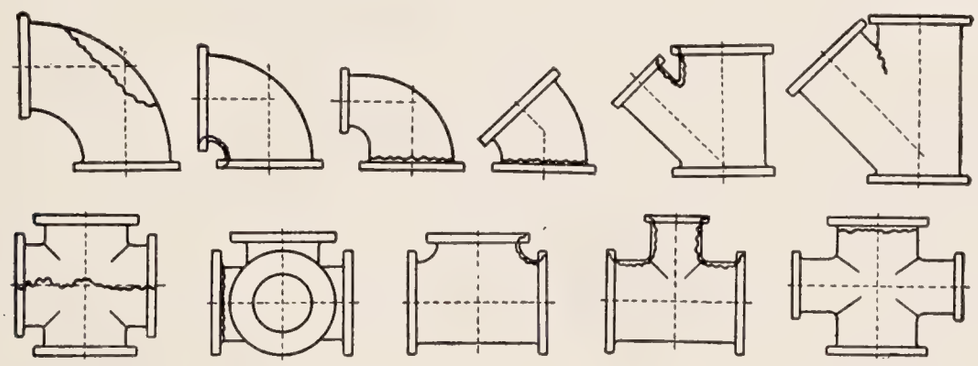
12-INCH EXTRA HEAVY TEES

Burst Ferrosteel, pounds per square inch	Tensile strength of Test Bar, pounds per square inch	Burst Cast Iron, pounds per square inch	Tensile strength of Test Bar, pounds per square inch
2,100	33,710	1,450	*21,550
2,200	32,690	1,500	22,190
2,000	32,630	1,450	22,940
2,100	34,070	.....	.....
2,000	33,200	.....	.....
1,800	31,730	.....	.....
12,200 Total	198,030 Total	4,400 Total	66,680 Total
2,033 Average	33,005 Average	1,466 Average	22,226 Average

*Flaw in test bar.

FORM AS A FACTOR IN DETERMINING BURSTING STRENGTH

It may not occur to some engineers that the shape of a fitting, to a great extent, determines its bursting strength. In testing out various fittings in the past Crane Co. has realized this and believes that its importance should be generally recognized.



To demonstrate the point clearly a selection was made of the following fittings of a certain size and they were subjected to hydraulic pressure to destruction. The results are typical with past experience both as to size and weight of fitting determined by the working pressure. Fittings were of uniform metal thickness throughout and the fractures showed clear metal without porous spots or sand holes:

Fitting	Burst at, Pounds
Long Turn Elbows	2800
45° Elbows	2600
Reducing Elbows (Large opening same as straight Elbows)	2600
Straight Elbows	2400
Reducing Tee (Large openings same as straight tee)	1700
Reducing Cross (Large openings same as straight cross)	1600
Four-way Tee	1600
Straight Tee	1500
Reducing Lateral (Large openings same as straight lateral)	1500
Straight Cross	1400
Straight Lateral	800

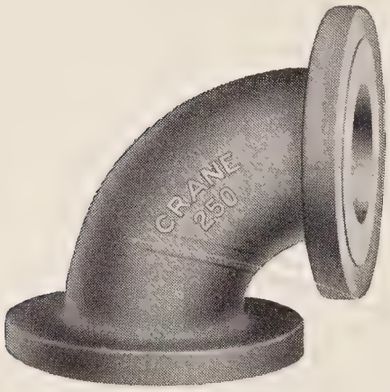
From the foregoing figures it will be seen that the strength of Elbows are practically the same regardless of degree or whether of straight or reducing sizes.

The figures also show that fittings of the same general shape as the Tee or Cross are of nearly the same strength and have relatively about two-thirds the strength of fittings of the Elbow shape.

It is noticeable that the straight lateral is weak, having, in fact, only about one-third the strength of the Elbow shape.

EXTRA HEAVY CAST IRON FLANGED FITTINGS

FOR STEAM WORKING PRESSURES UP TO 250 POUNDS



FLANGED ELBOWS
No. 101E
CODE: LINOLSAURE

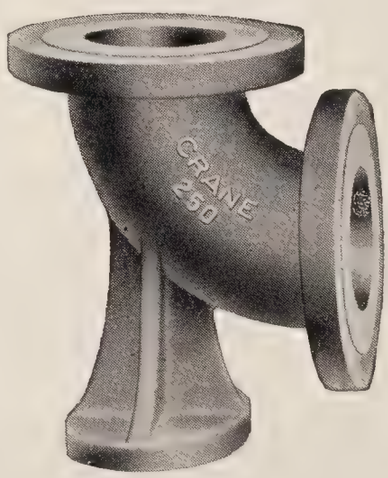
45° FLANGED ELBOWS
No. 103E
CODE: LISTADILLO

LONG RADIUS FLANGED ELBOWS
No. 127E
CODE: LOMELLINI

FLANGED
SQUARE BASE ELBOWS
No. 125E
CODE: LOBSPRUCHE

FLANGED BASE TEES
MADE TO ORDER

PRICES ON
APPLICATION



FLANGED
ROUND BASE ELBOWS
No. 125½E
CODE: LODIGIANO

EXTRA HEAVY CAST IRON FLANGED FITTINGS

FOR STEAM WORKING PRESSURES UP TO 250 POUNDS

Size Inches	Size Milli-meters	No. 101E Elbows Faced Each	No. 101E Elbows Faced and Drilled	No. 103E 45° Elbows Faced Each	No. 103E 45° Elbows Faced and Drilled	No. 127E Long Radius Elbows Faced Each	No. 127E Long Radius Elbows Faced and Drilled	No. 127E Long Radius Elbows Radius Inches
1¼	32	4.50	5.40	5.00	5.90			
1½	38	4.50	5.40	5.00	5.90			
2	50	4.50	5.40	5.00	5.90	7.50	8.85	5¼
2½	64	4.75	5.65	5.25	6.15	8.00	9.35	5⅝
3	76	5.15	6.25	5.65	6.75	8.60	10.25	6¼
3½	90	6.10	7.35	6.75	8.00	10.25	12.15	6⅞
4	100	6.75	8.25	7.50	9.00	11.25	13.50	7⅜
4½	113	8.25	9.75	9.00	10.50	13.75	16.00	7¾
5	125	9.35	10.85	10.35	11.85	15.50	17.75	8½
6	150	11.40	13.40	12.50	14.50	19.00	22.00	9⅝
7	175	15.75	18.00	16.50	18.75	26.50	29.85	10⅞
8	200	18.00	20.50	19.00	21.50	30.00	33.75	12
9	225	25.50	28.85	26.75	30.10	42.50	47.50	13
10	250	28.50	32.50	30.00	34.00	47.75	53.75	14⅛
12	300	42.00	46.50	44.00	48.50	70.00	76.75	16½
14	350	62.00	67.50	62.00	67.50	103.50	111.75	18⅞
15	375	70.00	77.00	70.00	77.00	117.00	127.00	20
16	400	82.00	90.00	82.00	90.00	137.00	149.00	21¼
18	450	106.00	115.00	106.00	115.00	177.00	191.00	23⅝
20	500	135.00	145.00	135.00	145.00	225.00	240.00	26
22	550	170.00	183.00	170.00	183.00			
24	600	210.00	225.00	210.00	225.00			

Size Inches	Siz Milli-meters	No. 125E and 125½E Base Elbows Faced Except Base Flange	Faced Drilled Except Base Flange	Facing and Drilling Base Flange
4	100	13.50	15.00	4.50
4½	113	16.50	18.00	4.50
5	125	18.75	20.25	5.25
6	150	22.75	24.75	5.25
7	175	31.50	33.75	5.25
8	200	36.00	38.50	7.50
9	225	51.00	54.35	7.50
10	250	57.00	61.00	7.50
12	300	84.00	88.50	11.00
14	350	105.00	110.50	11.00
15	375	120.00	127.00	11.00
16	400	135.00	143.00	11.00

Made to order of Ferrosteel at an advance in price, viz.:

Base Elbows 25 per cent.

90°-45° and Long Radius Elbows 3½-inch and smaller 50 per cent. 4-inch and larger 25 per cent.

For Superheated Steam Rating of Ferrosteel, see page 435.

All Fittings furnished faced only unless otherwise ordered.

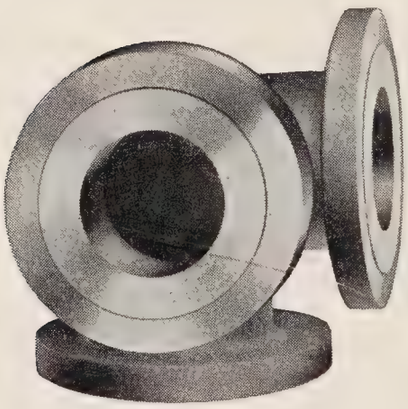
Templates for drilling page 598.

For General Dimensions see pages 656 and 657.

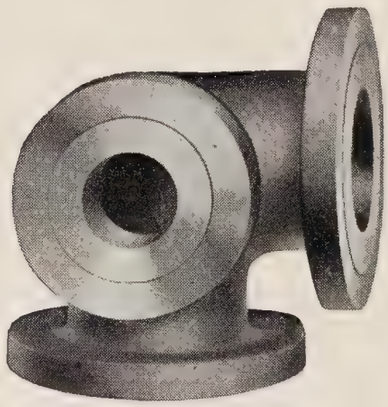
For Dimensions of Base Flange of Base Elbows see page 661.

EXTRA HEAVY CAST IRON FLANGED FITTINGS

FOR STEAM WORKING PRESSURES UP TO 250 POUNDS



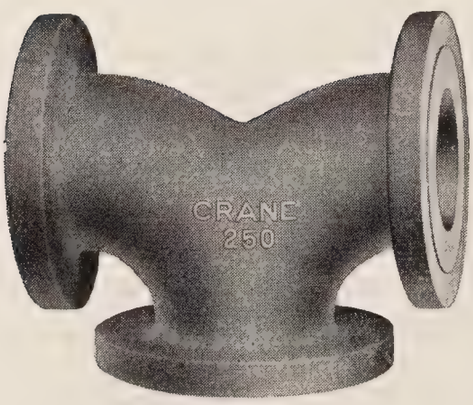
FLANGED SIDE OUTLET ELBOWS
No. 131 E
CODE: LOUVARLOU



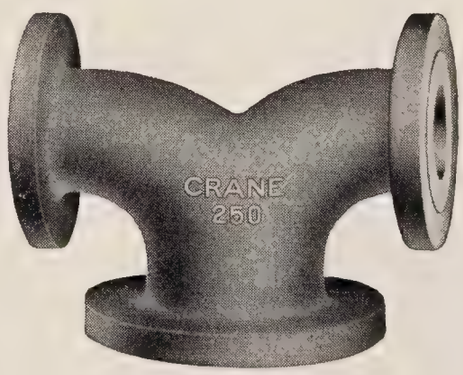
FLANGED REDUCING SIDE OUTLET ELBOWS
No. 133 E
CODE: LUCHADORA

Side Outlet Elbows are furnished with all openings on intersecting center lines.

FLANGED REDUCING TAPER ELBOWS
No. 121 E
CODE: LORENESA



FLANGED DOUBLE BRANCH ELBOWS
No. 139 E
CODE: LUCHERAMMO



FLANGED REDUCING DOUBLE BRANCH ELBOWS
No. 141 E
CODE: LUCULLISCH

When ordering either Side Outlet Elbows or Double Branch Elbows it is requested that a sketch be submitted showing exact size of all openings.

Double Branch Elbows having branches of two different sizes or reducing on the inlet are considered special and are made to order only at a special price.

EXTRA HEAVY CAST IRON FLANGED FITTINGS

FOR STEAM WORKING PRESSURES UP TO 250 POUNDS

Size Inches	Size Millimeters	No. 121E Taper Elbows Faced Each	No. 121E Taper Elbows Faced and Drilled	Size Inches	Size Millimeters	No. 121E Taper Elbows Faced Each	No. 121E Taper Elbows Faced and Drilled
2x1¼	50x32	9.00	9.90	7x6	175x150	31.50	33.75
2x1½	50x38	9.00	9.90	8x4	200x100	36.00	38.50
2½x1½	64x38	9.50	10.40	8x5	200x125	36.00	38.50
2½x2	64x50	9.50	10.40	8x6	200x150	36.00	38.50
3x1½	76x38	10.25	11.35	8x7	200x175	36.00	38.50
3x2	76x50	10.25	11.35	10x5	250x125	57.00	61.00
3x2½	76x64	10.25	11.35	10x6	250x150	57.00	61.00
3½x2	90x50	12.25	13.50	10x7	250x175	57.00	61.00
3½x2½	90x64	12.25	13.50	10x8	250x200	57.00	61.00
3½x3	90x76	12.25	13.50	12x7	300x175	84.00	88.50
4x2	100x50	13.50	15.00	12x8	300x200	84.00	88.50
4x2½	100x64	13.50	15.00	12x9	300x225	84.00	88.50
4x3	100x76	13.50	15.00	12x10	300x250	84.00	88.50
4x3½	100x90	13.50	15.00	14x6	350x150	105.00	110.50
5x2½	125x64	18.75	20.25	14x10	350x250	105.00	110.50
5x3	125x76	18.75	20.25	14x12	350x300	105.00	110.50
5x4	125x100	18.75	20.25	15x6	375x150	120.00	127.00
6x3	150x76	22.75	24.75	15x10	375x250	120.00	127.00
6x3½	150x90	22.75	24.75	15x12	375x300	120.00	127.00
6x4	150x100	22.75	24.75	16x8	400x200	135.00	143.00
6x4½	150x113	22.75	24.75	16x10	400x250	135.00	143.00
6x5	150x125	22.75	24.75	16x12	400x300	135.00	143.00
7x4	175x100	31.50	33.75	16x14	400x350	135.00	143.00
7x5	175x125	31.50	33.75				

Made to order of Ferrosteel, sizes 3½-inch and smaller at an advance of 50 per cent, and sizes 4-inch and larger, at an advance of 25 per cent.

Size Inches	Size Milli-meters	No. 139E Double Branch Elbows Faced Each	No. 139E Double Branch Elbows Faced and Drilled	No. 141E Reducing Double Branch Elbows Faced Each	No. 141E Reducing Double Branch Elbows Faced and Drilled	No. 131E Side Outlet Elbows Faced Each	No. 131E Side Outlet Elbows Faced and Drilled	No. 133E Reducing Side Outlet Elbows Faced Each	No. 133E Reducing Side Outlet Elbows Faced and Drilled
4	100	35.75	38.00	39.75	42.00	35.75	38.00	39.75	42.00
5	125	42.75	45.00	47.75	50.00	37.75	40.00	41.75	44.00
6	150	49.50	52.50	54.50	57.50	42.00	45.00	47.00	50.00
7	175	56.50	60.00	62.50	66.00	51.75	55.00	56.75	60.00
8	200	66.25	70.00	73.75	77.50	61.25	65.00	67.25	71.00
10	250	84.00	90.00	94.00	100.00	89.00	95.00	99.00	105.00
12	300	108.25	115.00	118.25	125.00	113.25	120.00	123.25	130.00
14	350	141.75	150.00	156.75	165.00	146.75	155.00	161.75	170.00
16	400	168.00	180.00	188.00	200.00	168.00	180.00	183.00	195.00

Made to order of Ferrosteel at an advance of 25 per cent.

For Superheated Steam Rating of Ferrosteel, see page 435

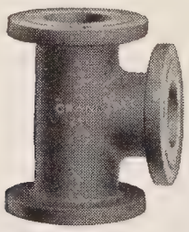
All fittings furnished faced only unless otherwise ordered. Larger sizes made to order. Prices on application.

For general dimensions, see pages 656 and 657.

Templates for drilling, page 598.

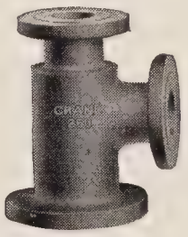
EXTRA HEAVY CAST IRON FLANGED FITTINGS

FOR STEAM WORKING PRESSURES UP TO 250 POUNDS



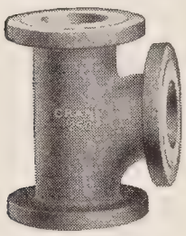
FLANGED TEES
No. 105 E

CODE: LUDESSERO



REDUCING FLANGED TEES
REDUCING IN RUN OR BRANCH
No. 107 E

CODE: LUGAREJO



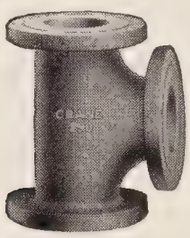
SINGLE SWEEP FLANGED TEES
No. 109 E

CODE: MANETHONIS

REDUCING SINGLE SWEEP FLANGED TEES
REDUCING IN RUN OR BRANCH
No. 111 E

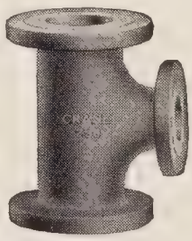
CODE: MANIATARLE

We do not make Single Sweep Tees with side openings larger than the run.



DOUBLE SWEEP FLANGED TEES
No. 112 E

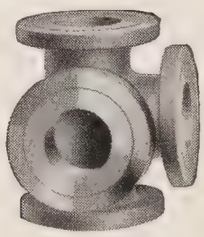
CODE: MARGAGITA



REDUCING
DOUBLE SWEEP FLANGED TEES
No. 112½ E

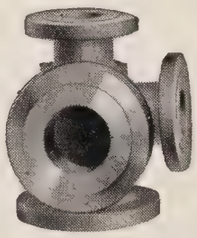
CODE: MARIQUINHA

Double Sweep Tees are not made reducing on the run. Should such Tees however, be wanted, we will alter patterns and change the dimensions (which will be expensive) and charge at a special price. Dimensions on request. We can only increase branch (outlet) within a reasonable limit, which must be regulated by our patterns.



FLANGED SIDE OUTLET TEES
No. 135 E

CODE: MARKSARKOM



REDUCING SIDE OUTLET FLANGED TEES
No. 137 E

CODE: MARNERAIT

When ordering Side Outlet Tees it is requested that a sketch be submitted showing exact size of all openings.

EXTRA HEAVY CAST IRON FLANGED FITTINGS

FOR STEAM WORKING PRESSURES UP TO 250 POUNDS

Size Inches	Size Millimeters	No. 105E Tees		No. 107E Reducing Tees		No. 109E, Single Sweep No. 112E, Double Sweep Straight Tees		No. 111E, Single Sweep No. 112½E, Double Sweep Reducing Tees	
		Faced Each	Faced and Drilled	Faced Each	Faced and Drilled	Faced Each	Faced and Drilled	Faced Each	Faced and Drilled
1¼	32	6.50	7.85						
1½	38	6.50	7.85	7.50	8.85				
2	50	6.50	7.85	7.50	8.85	7.50	8.85		
2½	64	6.90	8.25	8.00	9.35	8.00	9.35	9.15	10.50
3	76	7.50	9.15	8.60	10.25	8.60	10.25	9.90	11.55
3½	90	8.90	10.80	10.25	12.15	10.25	12.15	11.75	13.65
4	100	9.75	12.00	11.25	13.50	11.25	13.50	13.00	15.25
4½	113	12.00	14.25	13.75	16.00	13.75	16.00	15.75	18.00
5	125	13.50	15.75	15.50	17.75	15.50	17.75	17.85	20.10
6	150	16.50	19.50	19.00	22.00	19.00	22.00	22.00	25.00
7	175	23.00	26.35	26.50	29.85	26.50	29.85	30.50	33.85
8	200	26.00	29.75	30.00	33.75	30.00	33.75	34.50	38.25
9	225	37.00	42.00	42.50	47.50	42.50	47.50	49.00	54.00
10	250	41.50	47.50	47.75	53.75	47.75	53.75	55.00	61.00
12	300	61.00	67.75	70.00	76.75	70.00	76.75	80.00	86.75
14	350	90.00	98.25	103.50	111.75	103.50	111.75	119.00	127.25
15	375	102.00	112.00	117.00	127.00	117.00	127.00	135.00	145.00
16	400	119.00	131.00	137.00	149.00	137.00	149.00	158.00	170.00
18	450	154.00	168.00	177.00	191.00	177.00	191.00	204.00	218.00
20	500	195.00	210.00	225.00	240.00	225.00	240.00	260.00	275.00
22	550	247.00	267.00	285.00	305.00	285.00	305.00	327.00	347.00
24	600	305.00	328.00	350.00	373.00	350.00	373.00	402.00	425.00

See pages 720 and 721 for advanced prices beyond regular list and discount on Reducing Tees not carried in stock. Made to order of Ferrosteel, sizes 3½-inch and smaller, at an advance of 50 per cent, and sizes 4-inch and larger, at an advance of 25 per cent.

An assortment of reducing tees No. 107 E is carried in stock as per list on pages 720 and 721. To overcome the delay in filling orders for such sizes as are not carried in stock, we can use the reducing flanges with ribs, as per note and illustration on page 719, if desired by the customer.

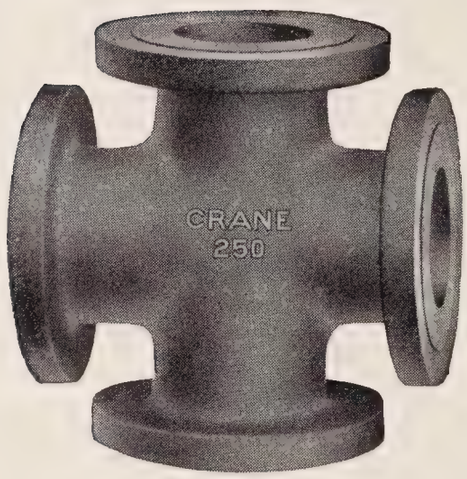
Size Inches	Size Millimeters	No. 135E Side Outlet Tees		No. 137E Reducing Side Outlet Tees	
		Faced Each	Faced and Drilled	Faced Each	Faced and Drilled
4	100	42.00	45.00	47.00	50.00
5	125	47.00	50.00	52.00	55.00
6	150	53.50	57.50	59.00	63.00
7	175	63.00	67.50	70.50	75.00
8	200	72.50	77.50	80.00	85.00
10	250	102.00	110.00	112.00	120.00
12	300	131.00	140.00	146.00	155.00
14	350	159.00	170.00	174.00	185.00
16	400	184.00	200.00	204.00	220.00

MADE TO ORDER OF FERROSTEEL AT AN ADVANCE OF 25 PER CENT

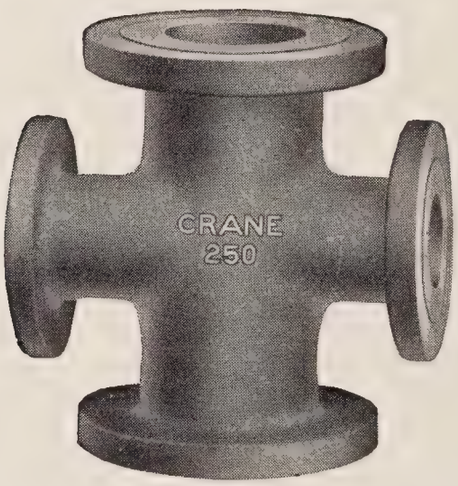
For Superheated Steam Rating of Ferrosteel, see page 435.
Furnished faced only, unless otherwise ordered.
For general dimensions, see pages 656 to 658.
For drilling templates, see page 598.

EXTRA HEAVY CAST IRON FLANGED FITTINGS

FOR STEAM WORKING PRESSURES UP TO 250 POUNDS

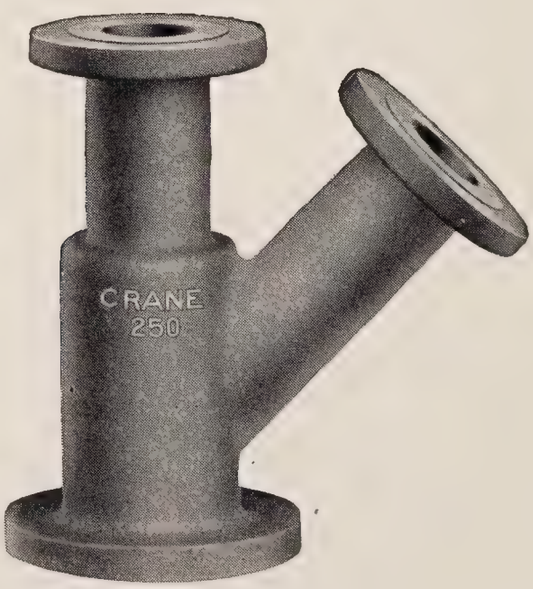


FLANGED CROSSES
No. 113 E
CODE: MAROKIJNEN



REDUCING FLANGED CROSSES
No. 115 E
CODE: MASTELEROS

45° FLANGED LATERALS
No. 117 E
CODE: MASTIQUANT



REDUCING 45° FLANGED LATERALS
REDUCING IN RUN OR BRANCH
No. 119 E
CODE: MAUERSOHLE

EXTRA HEAVY CAST IRON

FLANGED FITTINGS

FOR STEAM WORKING PRESSURES UP TO 250 POUNDS

Size	Size	No. 113E Crosses		No. 115E Reducing Crosses		No. 117E Laterals		No. 119E Reducing Laterals	
Inches	Millimeters	Faced Each	Faced and Drilled	Faced Each	Faced and Drilled	Faced Each	Faced and Drilled	Faced Each	Faced and Drilled
1¼	32	10.00	11.80						
1½	38	10.00	11.80						
2	50	10.00	11.80	11.50	13.30	10.00	11.80		
2½	64	10.50	12.30	12.00	13.80	10.50	12.30	12.00	13.80
3	76	11.50	13.75	13.25	15.50	11.50	13.75	13.25	15.50
3½	90	13.50	16.00	15.50	18.00	13.50	16.00	15.50	18.00
4	100	15.00	18.00	17.00	20.00	15.00	18.00	17.00	20.00
4½	113	18.00	21.00	21.00	24.00	18.00	21.00	21.00	24.00
5	125	20.50	23.50	23.50	26.50	20.50	23.50	23.50	26.50
6	150	25.00	29.00	29.00	33.00	25.00	29.00	29.00	33.00
7	175	35.00	39.50	40.00	44.50	35.00	39.50	40.00	44.50
8	200	40.00	45.00	46.00	51.00	40.00	45.00	46.00	51.00
9	225	56.00	62.75	65.00	71.75	56.00	62.75	65.00	71.75
10	250	63.00	71.00	72.00	80.00	63.00	71.00	72.00	80.00
12	300	92.00	101.00	106.00	115.00	92.00	101.00	106.00	115.00
14	350	136.00	147.00	158.00	169.00	136.00	147.00	158.00	169.00
15	375	155.00	169.00	177.00	191.00	155.00	169.00	177.00	191.00
16	400	180.00	196.00	207.00	223.00	180.00	196.00	207.00	223.00
18	450	235.00	253.00	270.00	288.00	235.00	253.00	270.00	288.00
20	500	300.00	320.00	345.00	365.00	300.00	320.00	345.00	365.00
22	550	375.00	401.00	430.00	456.00	375.00	401.00	430.00	456.00
24	600	465.00	495.00	535.00	565.00	465.00	495.00	535.00	565.00

Made to order of ferrosteel, sizes 3½-inch and smaller, at an advance of 50 per cent, and sizes 4-inch and larger at an advance of 25 per cent.

For Superheated Steam Rating of Ferrosteel, see page 435.

Furnished faced only, unless otherwise ordered.

For general dimensions, see pages 656 to 659.

For drilling templates, see page 598.

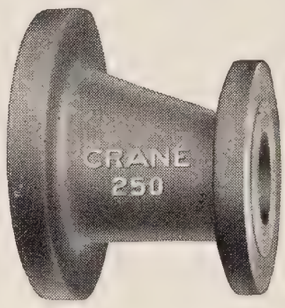
See page 721 for advance prices beyond regular list and discount on Reducing Crosses and Laterals not carried in stock.

For list of reducing sizes carried in stock, see page 721.

EXTRA HEAVY CAST IRON FLANGED TAPER REDUCERS

FOR SATURATED STEAM WORKING PRESSURES UP TO 250 POUNDS

FOR SUPERHEATED STEAM RATING OF FERROSTEEL SEE PAGE 435



FLANGED TAPER REDUCERS
No. 123E

CODE: MAUSEGRAU

FLANGED ECCENTRIC TAPER REDUCERS
No. 123½E

CODE: MEDENIJGEN

PRICES ON APPLICATION

Size Inches	Size Millimeters	No. 123 E Faced Each	No. 123 E Faced and Drilled Each	Size Inches	Size Millimeters	No. 123 E Faced Each	No. 123 E Faced and Drilled Each
2½x2	64x50	9.50	10.40	12x10	300x250	84.00	88.50
3x2	76x50	10.25	11.35	14x6	350x150	105.00	110.50
3½x2½	90x64	12.25	13.50	14x8	350x200	105.00	110.50
4x2	100x50	13.50	15.00	14x10	350x250	105.00	110.50
4x2½	100x64	13.50	15.00	14x12	350x300	105.00	110.50
4x3	100x76	13.50	15.00	15x8	375x200	120.00	127.00
5x2	125x50	18.75	20.25	15x10	375x250	120.00	127.00
5x2½	125x64	18.75	20.25	15x12	375x300	120.00	127.00
5x3	125x76	18.75	20.25	15x14	375x350	120.00	127.00
5x4	125x100	18.75	20.25	16x8	400x200	135.00	143.00
6x3	150x76	22.75	24.75	16x10	400x250	135.00	143.00
6x3½	150x90	22.75	24.75	16x12	400x300	135.00	143.00
6x4	150x100	22.75	24.75	16x14	400x350	135.00	143.00
6x5	150x125	22.75	24.75	18x10	450x250	157.00	166.00
7x3	175x76	31.50	33.75	18x12	450x300	157.00	166.00
7x4	175x100	31.50	33.75	18x14	450x350	157.00	166.00
7x5	175x125	31.50	33.75	18x16	450x400	157.00	166.00
7x6	175x150	31.50	33.75	20x12	500x300	180.00	190.00
8x3	200x76	36.00	38.50	20x14	500x350	180.00	190.00
8x4	200x100	36.00	38.50	20x16	500x400	180.00	190.00
8x5	200x125	36.00	38.50	20x18	500x450	180.00	190.00
8x6	200x150	36.00	38.50	22x14	550x350	225.00	238.00
10x4	250x100	57.00	61.00	22x16	550x400	225.00	238.00
10x5	250x125	57.00	61.00	22x18	550x450	225.00	238.00
10x6	250x150	57.00	61.00	22x20	550x500	225.00	238.00
10x8	250x200	57.00	61.00	24x16	600x400	285.00	300.00
12x5	300x125	84.00	88.50	24x18	600x450	285.00	300.00
12x6	300x150	84.00	88.50	24x20	600x500	285.00	300.00
12x8	300x200	84.00	88.50	24x22	600x550	285.00	300.00

For general dimensions, see pages 656 and 657.
For drilling templates, see page 598.
Flanged Taper Reducers of any other dimensions, or Ferrosteel, will be made to order at a special price.

EXTRA PRICE FOR GALVANIZING

EXTRA HEAVY
FLANGED FITTINGS AND FLANGES

Galvanized Extra Heavy, Cast Iron or Ferrosteel Flanged Fittings and Companion Flanges will be made to order at an advance over the black price as below:

Size	Size	No. 101E Flanged Elbows No. 121E Reducing Flanged Elbows No. 103E Flanged 45° Elbows or No. 123E Flanged Taper Reducers	Nos. 105E, 107E, 109E, 111E, 112E, 112½E Flanged Tees and Flanged Reducing Tees Nos. 125E, 125½E Flanged Base Elbows or No. 127E Flanged Long Radius Elbows	Nos. 113E, 115E Flanged Crosses and Flanged Reducing Crosses or Nos. 117E, 119E Flanged Laterals and Flanged Reducing Laterals	Nos. 151E, 251E Companion Flanges	Nos. 155E, 255E Reducing Companion Flanges or Nos. 153E, 253E Blind Flanges	
						Diameter Inches	Extra, Each
Inches	Millimeters	Extra, Each	Extra, Each	Extra, Each	Extra, Each		
1¼	32	3.00	4.50	6.00	.85		
1½	38	3.00	4.50	6.00	.85	6	1.25
2	50	3.00	4.50	6.00	1.00	6½	1.50
2½	64	3.10	4.65	6.25	1.05	7½	1.60
3	76	3.50	5.25	7.00	1.15	8¼	1.75
3½	90	4.10	6.15	8.25	1.40	9	2.10
4	100	4.50	6.75	9.00	1.65	10	2.50
4½	113	5.50	8.25	11.00	1.75	10½	2.65
5	125	6.00	9.00	12.00	1.90	11	2.85
6	150	7.50	11.25	15.00	2.30	12½	3.50
7	175	10.00	15.00	20.00	3.00	14	4.50
8	200	11.25	16.75	22.50	3.50	15	5.25
9	225	16.00	24.00	32.00	4.15	16¼	6.25
10	250	18.00	27.00	36.00	5.25	17½	8.00
12	300	26.00	39.00	52.00	7.00	20½	10.50
14	350	37.50	56.00	75.00	10.00	23	15.00
15	375	44.00	66.00	88.00	12.50	24½	19.00
16	400	50.00	75.00	100.00	15.00	25½	22.50

EXTRA HEAVY

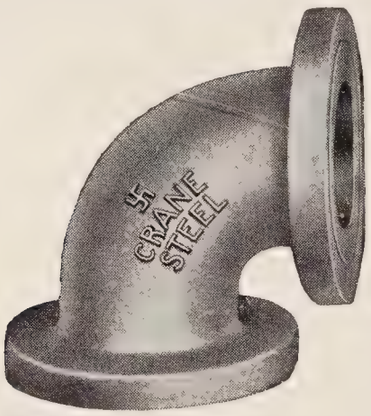
CAST STEEL FLANGED FITTINGS

FOR STEAM WORKING PRESSURES UP TO 350 POUNDS AND A TOTAL TEMPERATURE OF 800 DEGREES

FOR 500 POUNDS WATER WORKING PRESSURE

STEEL BOLTS OF HIGH TENSILE STRENGTH or commercial bolts larger in diameter must be used on the end flanges when these fittings are subjected to steam working pressures in excess of 300 pounds.

A. S. M. E. EXTRA HEAVY BOLTING using commercial bolts is not strong enough for steam working pressures in excess of 300 pounds.



FLANGED ELBOWS
No. 101D

CODE: MEJENTIBUS

45° FLANGED ELBOWS
No. 103D

CODE: MELATROFIA

Size Inches	Size Millimeters	No. 101D Faced Each	No. 101D Faced Drilled and Spot Faced	No. 103D Faced Each	No. 103D Faced Drilled and Spot Faced
1¼	32	9.00	11.00	9.00	11.00
1½	38	10.00	12.00	10.00	12.00
2	50	11.00	13.00	11.00	13.00
2½	64	13.00	15.00	13.00	15.00
3	76	14.00	17.00	14.00	17.00
3½	90	17.00	20.00	17.00	20.00
4	100	19.00	22.00	19.00	22.00
4½	113	22.00	25.00	22.00	25.00
5	125	24.00	27.00	24.00	27.00
6	150	29.00	33.00	29.00	33.00
7	175	36.00	41.00	36.00	41.00
8	200	43.00	48.00	43.00	48.00
9	225	52.00	57.00	52.00	57.00
10	250	61.00	67.00	61.00	67.00
12	300	77.00	84.00	77.00	84.00
14	350	100.00	108.00	100.00	108.00
15	375	112.00	120.00	112.00	120.00
16	400	130.00	140.00	130.00	140.00
18	450	170.00	180.00	170.00	180.00
20	500	210.00	225.00	210.00	225.00
22	550	270.00	290.00	270.00	290.00
24	600	335.00	355.00	335.00	355.00

The flanges of these Fittings are regularly furnished with a raised face 1/16-inch high. For diameters see page 665.

For general dimensions, see pages 656 and 657.

For drilling templates, see page 598.

EXTRA HEAVY

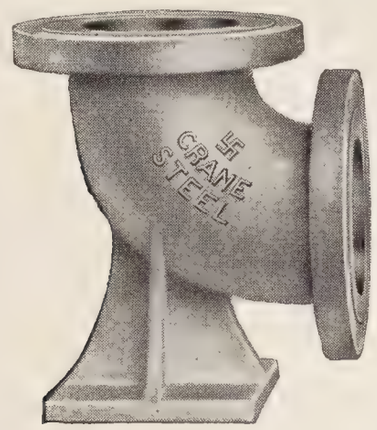
CAST STEEL FLANGED FITTINGS

FOR STEAM WORKING PRESSURES UP TO 350 POUNDS AND A TOTAL TEMPERATURE OF 800 DEGREES

FOR 500 POUNDS WATER WORKING PRESSURES

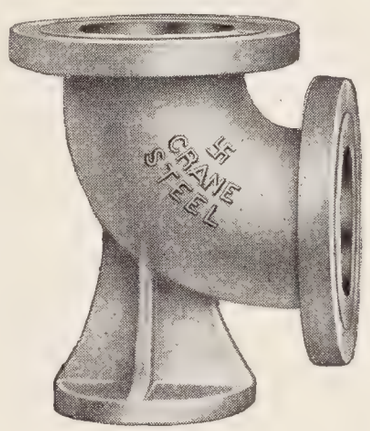
STEEL BOLTS OF HIGH TENSILE STRENGTH or commercial bolts larger in diameter must be used on the end flanges when these fittings are subjected to steam working pressures in excess of 300 pounds.

A. S. M. E. EXTRA HEAVY BOLTING using commercial bolts is not strong enough for steam working pressures in excess of 300 pounds.



FLANGED
SQUARE BASE ELBOWS
No. 125 D

CODE: MELOPHAGUS



FLANGED
ROUND BASE ELBOWS
No. 125½ D

CODE: MEMOREVOLE

Size Inches	Size Millimeters	No. 125 D or No. 125½ D		
		Faced, Except Base Flange Each	Faced, Drilled and Spot Faced, Except Base Flange	Facing, Drilling and Spot Facing Base Flange
4	100	28.00	32.00	3.00
4½	113	33.00	37.00	3.00
5	125	37.00	41.00	3.00
6	150	44.00	50.00	3.00
7	175	54.00	61.00	6.00
8	200	63.00	70.00	6.00
9	225	76.00	83.00	8.00
10	250	88.00	97.00	8.00
12	300	110.00	120.00	10.00
14	350	148.00	160.00	12.00
15	375	165.00	177.00	13.00
16	400	190.00	205.00	15.00

The flanges of these Fittings are regularly furnished with a raised face 1/16-inch high. For diameters, see page 665.

Sizes above 16 inches, prices on application.

FLANGED BASE TEES MADE TO ORDER

For general dimensions, see pages 656 to 657.
For drilling templates, see page 598.

EXTRA HEAVY

CAST STEEL FLANGED FITTINGS

FOR STEAM WORKING PRESSURES UP TO 350 POUNDS AND A TOTAL TEMPERATURE OF 800 DEGREES

FOR 500 POUNDS WATER WORKING PRESSURES

STEEL BOLTS OF HIGH TENSILE STRENGTH or commercial bolts larger in diameter must be used on the end flanges when these fittings are subjected to steam working pressures in excess of 300 pounds.

A. S. M. E. EXTRA HEAVY BOLTING using commercial bolts is not strong enough for steam working pressures in excess of 300 pounds.

FLANGED LONG RADIUS ELBOWS
No. 127 D
CODE: MENETEKEL

Size Inches	Size Millimeters	No. 127 D Faced Each	No. 127 D Faced Drilled and Spot Faced	No. 127 D Radius Inches
2	50	14.00	17.00	5¼
2½	64	16.00	19.00	5⅝
3	76	18.00	22.00	6¼
3½	90	22.00	26.00	6⅞
4	100	25.00	29.00	7⅜
4½	113	30.00	34.00	7¾
5	125	35.00	39.00	8½
6	150	42.00	48.00	9⅝
7	175	52.00	59.00	10⅞
8	200	63.00	70.00	12
9	225	72.00	79.00	13
10	250	83.00	92.00	14⅛
12	300	105.00	115.00	16½
14	350	145.00	157.00	18⅞
15	375	160.00	172.00	20
16	400	190.00	205.00	21¼
18	450			23⅝
20	500			26

The flanges of these Fittings are regularly furnished with a raised face 1/16-inch high. For diameters, see page 665.

Long Radius Elbows of dimensions differing from the above made to order at a special price.

For general dimensions, see pages 656 to 657.
For drilling templates, see page 598.

EXTRA HEAVY

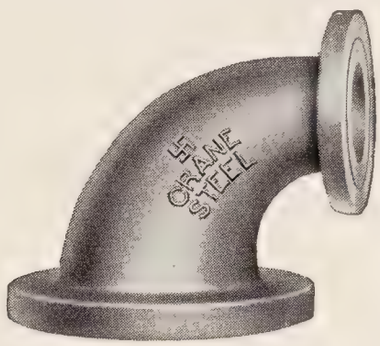
CAST STEEL FLANGED FITTINGS

FOR STEAM WORKING PRESSURES UP TO 350 POUNDS AND A TOTAL TEMPERATURE OF 800 DEGREES

FOR 500 POUNDS WATER WORKING PRESSURE

STEEL BOLTS OF HIGH TENSILE STRENGTH or commercial bolts larger in diameter must be used on the end flanges when these fittings are subjected to steam working pressures in excess of 300 pounds.

A. S. M. E. EXTRA HEAVY BOLTING using commercial bolts is not strong enough for steam working pressures in excess of 300 pounds.



FLANGED REDUCING TAPER ELBOWS
No. 121 D
CODE: MENINGETTE

Size	Size	No. 121 D		Size	Size	No. 121 D	
		Faced	Faced, Drilled and Spot Faced			Faced	Faced, Drilled and Spot Faced
Inches	Millimeters	Each		Inches	Millimeters	Each	
2 x1¼	50x 32	14.00	16.00	7x 6	175x150	43.00	48.00
2 x1½	50x 38	14.00	16.00	8x 4	200x100	51.00	56.00
2½x1½	64x 38	16.00	18.00	8x 5	200x125	51.00	56.00
2½x2	64x 50	16.00	18.00	8x 6	200x150	51.00	56.00
3 x1½	76x 38	17.00	20.00	8x 7	200x175	51.00	56.00
3 x2	76x 50	17.00	20.00	10x 5	250x125	73.00	79.00
3 x2½	76x 64	17.00	20.00	10x 6	250x150	73.00	79.00
3½x2	90x 50	21.00	24.00	10x 7	250x175		
3½x2½	90x 64	21.00	24.00	10x 8	250x200	73.00	79.00
3½x3	90x 76	21.00	24.00	12x 7	300x175	93.00	100.00
4 x2	100x 50	23.00	26.00	12x 8	300x200	93.00	100.00
4 x2½	100x 64	23.00	26.00	12x 9	300x225	93.00	100.00
4 x3	100x 76	23.00	26.00	12x10	300x250	93.00	100.00
4 x3½	100x 90	23.00	26.00	14x 6	350x150	120.00	128.00
5 x2½	125x 64	29.00	32.00	14x10	350x250	120.00	128.00
5 x3	125x 76	29.00	32.00	14x12	350x300	120.00	128.00
5 x4	125x100	29.00	32.00	15x 6	375x150	135.00	143.00
6 x3	150x 76	35.00	39.00	15x10	375x250	135.00	143.00
6 x3½	150x 90	35.00	39.00	15x12	375x300	135.00	143.00
6 x4	150x100	35.00	39.00	16x 8	400x200	155.00	165.00
6 x4½	150x113	35.00	39.00	16x10	400x250	155.00	165.00
6 x5	150x125	35.00	39.00	16x12	400x300	155.00	165.00
7 x4	175x100	43.00	48.00	16x14	400x350	155.00	165.00
7 x5	175x125	43.00	48.00				

The flanges of these Fittings are regularly furnished with a raised face 1/16-inch high. For diameters, see page 665.

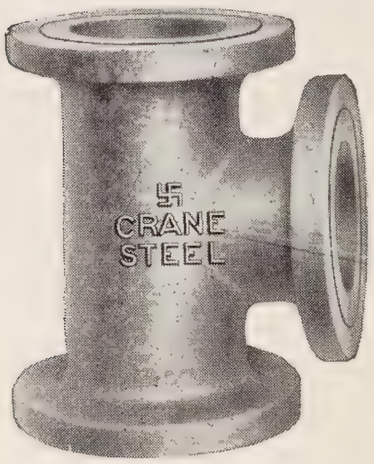
For general dimensions, see pages 656 to 657. For drilling templates, see page 598.

EXTRA HEAVY

CAST STEEL FLANGED FITTINGS

STEEL BOLTS OF HIGH TENSILE STRENGTH or commercial bolts larger in diameter must be used on the end flanges when these fittings are subjected to steam working pressures in excess of 300 pounds.

A. S. M. E. EXTRA HEAVY BOLTING using commercial bolts is not strong enough for steam working pressures in excess of 300 pounds.



FLANGED TEES
No. 105 D
CODE: MERKELIJK

FOR STEAM WORKING PRESSURES UP TO 350 POUNDS AND A TOTAL TEMPERATURE OF 800 DEGREES

FOR 500 POUNDS WATER WORKING PRESSURES

REDUCING FLANGED TEES
REDUCING IN RUN OR BRANCH
No. 107 D
CODE: MERSABIMUR

Size	Size	No. 105 D		No. 107 D	
		Faced	Faced, Drilled and Spot Faced	Faced	Faced, Drilled and Spot Faced
Inches	Millimeters	Each		Each	
1¼	32	13.00	16.00		
1½	38	14.00	17.00		
2	50	15.00	18.00	15.00	18.00
2½	64	17.00	20.00	17.00	20.00
3	76	19.00	23.00	19.00	23.00
3½	90	22.00	26.00	22.00	26.00
4	100	25.00	29.00	25.00	29.00
4½	113	30.00	34.00	30.00	34.00
5	125	33.00	37.00	33.00	37.00
6	150	40.00	46.00	40.00	46.00
7	175	49.00	56.00	49.00	56.00
8	200	58.00	65.00	58.00	65.00
9	225	69.00	76.00	69.00	76.00
10	250	81.00	90.00	81.00	90.00
12	300	100.00	110.00	100.00	110.00
14	350	135.00	147.00	135.00	147.00
15	375	150.00	162.00	150.00	162.00
16	400	175.00	190.00	175.00	190.00
18	450	230.00	245.00	230.00	245.00
20	500	300.00	320.00	300.00	320.00
22	550	375.00	405.00	375.00	405.00
24	600	460.00	490.00	460.00	490.00

The flanges on these Fittings are regularly furnished with a raised face 1/16-inch high. For diameters, see page 665.

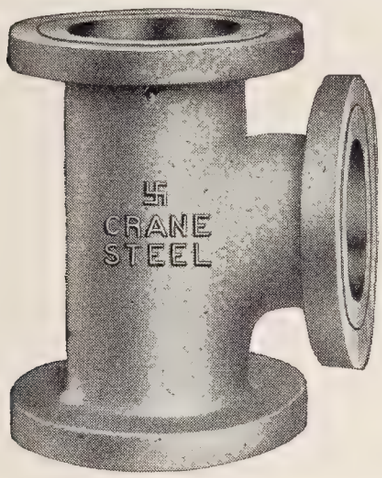
For general dimensions, see pages 656 to 658. For drilling templates, see page 598.

EXTRA HEAVY

CAST STEEL FLANGED FITTINGS

STEEL BOLTS OF HIGH TENSILE STRENGTH or commercial bolts larger in diameter must be used on the end flanges when these fittings are subjected to steam working pressures in excess of 300 pounds.

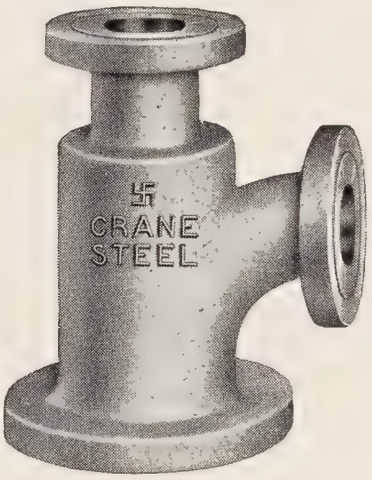
A. S. M. E. EXTRA HEAVY BOLTING using commercial bolts is not strong enough for steam working pressures in excess of 300 pounds.



SINGLE SWEEP FLANGED TEES
No. 109 D
CODE: MERSATURUS

FOR STEAM WORKING PRESSURES UP TO 350 POUNDS AND A TOTAL TEMPERATURE OF 800 DEGREES

FOR 500 POUNDS WATER WORKING PRESSURES



REDUCING SINGLE SWEEP FLANGED TEES REDUCING IN RUN OR BRANCH
No. 111 D
CODE: MESOBRAQUE

Size	Size	No. 109 D		No. 111 D	
		Faced	Faced, Drilled and Spot Faced	Faced	Faced, Drilled and Spot Faced
Inches	Millimeters	Each		Each	
2	50	16.50	19.50		
2½	64	19.00	22.00	19.00	22.00
3	76	21.00	25.00	21.00	25.00
3½	90	24.00	28.00	24.00	28.00
4	100	28.00	32.00	28.00	32.00
4½	113	33.00	37.00	33.00	37.00
5	125	37.00	41.00	37.00	41.00
6	150	44.00	50.00	44.00	50.00
7	175	54.00	61.00	54.00	61.00
8	200	63.00	70.00	63.00	70.00
9	225	76.00	83.00	76.00	83.00
10	250	88.00	97.00	88.00	97.00
12	300	110.00	120.00	110.00	120.00
14	350	148.00	160.00	148.00	160.00
15	375	165.00	177.00	165.00	177.00
16	400	190.00	205.00	190.00	205.00
18	450	255.00	270.00	255.00	270.00
20	500	330.00	350.00	330.00	350.00
22	550	415.00	445.00	415.00	445.00
24	600	505.00	535.00	505.00	535.00

The flanges of these Fittings are regularly furnished with a raised face 1/16-inch high. For diameters, see page 665.

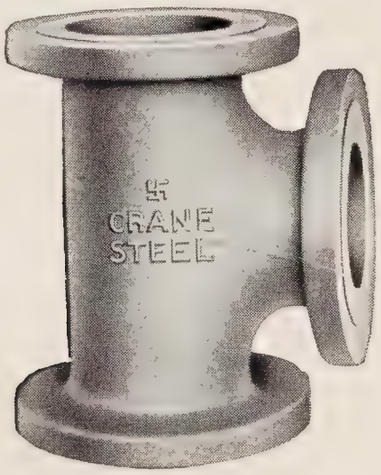
We do not make Single Sweep Tees with side openings larger than the run.

For general dimensions, see pages 656 to 658. For drilling templates, see page 598.

EXTRA HEAVY
CAST STEEL FLANGED FITTINGS

STEEL BOLTS OF HIGH TENSILE STRENGTH or commercial bolts larger in diameter must be used on the end flanges when these fittings are subjected to steam working pressures in excess of 300 pounds.

A. S. M. E., EXTRA HEAVY BOLTING using commercial bolts is not strong enough for steam working pressures in excess of 300 pounds.



FOR STEAM WORKING PRESSURES UP TO 350 POUNDS AND A TOTAL TEMPERATURE OF 800 DEGREES

FOR 500 LB. WATER WORKING PRESSURE.

DOUBLE SWEEP FLANGED TEES
No. 112 D

CODE: MESONAUTA

REDUCING DOUBLE SWEEP FLANGED TEES
No. 112½ D

CODE: METROACUM

Size	Size	No. 112 D		No. 112½ D	
		Faced	Faced, Drilled and Spot Faced	Faced	Faced, Drilled and Spot Faced
Inches	Millimeters	Each		Each	
2	50	16.50	19.50		
2½	64	19.00	22.00	19.00	22.00
3	76	21.00	25.00	21.00	25.00
3½	90	24.00	28.00	24.00	28.00
4	100	28.00	32.00	28.00	32.00
4½	113	33.00	37.00	33.00	37.00
5	125	37.00	41.00	37.00	41.00
6	150	44.00	50.00	44.00	50.00
7	175	54.00	61.00	54.00	61.00
8	200	63.00	70.00	63.00	70.00
9	225	76.00	83.00	76.00	83.00
10	250	88.00	97.00	88.00	97.00
12	300	110.00	120.00	110.00	120.00
14	350	148.00	160.00	148.00	160.00
15	375	165.00	177.00	165.00	177.00
16	400	190.00	205.00	190.00	205.00
18	450	255.00	270.00	255.00	270.00
20	500	330.00	350.00	330.00	350.00
22	550	415.00	445.00	415.00	445.00
24	600	505.00	535.00	505.00	535.00

The flanges of these Fittings are regularly furnished with a raised face $\frac{1}{16}$-inch high. For diameters, see page 665.

Regularly double Sweep Tees are not made reducing on the run. If such Fittings are wanted we will make them to order at a special price.

We can make outlet or branch larger than run only within a reasonable limit, depending upon our pattern dimensions.

For general dimensions, see pages 656 to 658.

For drilling templates, see page 598.

EXTRA HEAVY
CAST STEEL FLANGED FITTINGS
FOR STEAM WORKING PRESSURES UP TO 350 POUNDS AND A TOTAL TEMPERATURE OF 800 DEGREES FOR 500 POUNDS WATER WORKING PRESSURES

STEEL BOLTS OF HIGH TENSILE STRENGTH or commercial bolts larger in diameter must be used on the end flanges when these fittings are subjected to steam working pressures in excess of 300 pounds.

A. S. M. E. EXTRA HEAVY BOLTING using commercial bolts is not strong enough for steam working pressures in excess of 300 pounds.

FLANGED LATERALS
No. 117 D
CODE: METRODORUS

REDUCING FLANGED LATERALS
REDUCING IN RUN OR BRANCH
No. 119 D
CODE: MEULARDEAU

Size	Size	No. 117 D		No. 119 D	
		Faced	Faced, Drilled and Spot Faced	Faced	Faced, Drilled and Spot Faced
Inches	Millimeters	Each		Each	
2	50	21.00	25.00		
2½	64	25.00	29.00		
3	76	27.00	33.00		
3½	90	32.00	38.00		
4	100	36.00	42.00	36.00	42.00
4½	113	42.00	48.00	42.00	48.00
5	125	45.00	51.00	45.00	51.00
6	150	55.00	63.00	55.00	63.00
7	175	68.00	78.00	68.00	78.00
8	200	81.00	91.00	81.00	91.00
9	225	100.00	110.00	100.00	110.00
10	250	115.00	127.00	115.00	127.00
12	300	145.00	160.00	145.00	160.00
14	350	190.00	205.00	190.00	205.00
15	375	210.00	225.00	210.00	225.00
16	400	245.00	265.00	245.00	265.00
18	450	320.00	340.00	320.00	340.00
20	500	400.00	430.00		
22	550	510.00	550.00		
24	600	635.00	675.00		

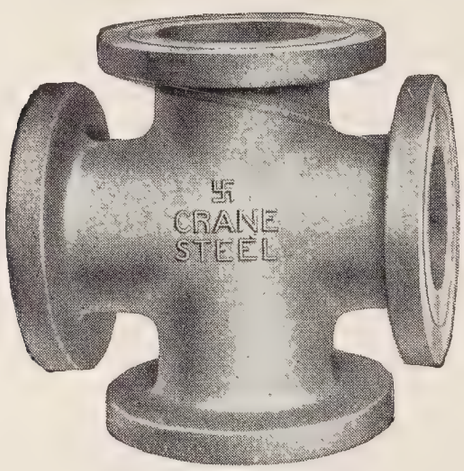
The flanges on these Fittings are regularly furnished with a raised face 1/16-inch high. For diameters, see page 665.

For general dimensions, see pages 656 to 659.
For drilling templates, see page 598.

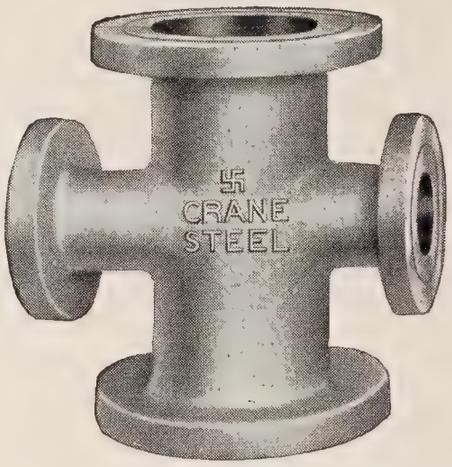
EXTRA HEAVY
CAST STEEL FLANGED FITTINGS
FOR STEAM WORKING PRESSURES UP TO 350 POUNDS AND A TOTAL TEMPERATURE OF 800 DEGREES FOR 500 POUNDS WATER WORKING PRESSURES

STEEL BOLTS OF HIGH TENSILE STRENGTH or commercial bolts larger in diameter must be used on the end flanges when these fittings are subjected to steam working pressures in excess of 300 pounds.

A. S. M. E. EXTRA HEAVY BOLTING using commercial bolts is not strong enough for steam working pressures in excess of 300 pounds.



FLANGED CROSSES
No. 113 D
CODE: MEVELAVITA



REDUCING FLANGED CROSSES
No. 115 D
CODE: MIDASAFFE

Size	Size	No. 113 D		No. 115 D	
		Faced	Faced, Drilled and Spot Faced	Faced	Faced, Drilled and Spot Faced
Inches	Millimeters	Each		Each	
1¼	32	17.00	21.00		
1½	38	19.00	23.00		
2	50	21.00	25.00	21.00	25.00
2½	64	25.00	29.00	25.00	29.00
3	76	27.00	33.00	27.00	33.00
3½	90	32.00	38.00	32.00	38.00
4	100	36.00	42.00	36.00	42.00
4½	113	42.00	48.00	42.00	48.00
5	125	45.00	51.00	45.00	51.00
6	150	55.00	63.00	55.00	63.00
7	175	68.00	78.00	68.00	78.00
8	200	81.00	91.00	81.00	91.00
9	225	100.00	110.00	100.00	110.00
10	250	115.00	127.00	115.00	127.00
12	300	145.00	160.00	145.00	160.00
14	350	190.00	205.00	190.00	205.00
15	375	210.00	225.00	210.00	225.00
16	400	245.00	265.00	245.00	265.00
18	450	320.00	340.00	320.00	340.00
20	500	400.00	430.00	400.00	430.00
22	550	510.00	550.00	510.00	550.00
24	600	635.00	675.00	635.00	675.00

The flanges on these Fittings are regularly furnished with a raised face 1/16-inch high. For diameters, see page 665.

For general dimensions, see pages 656 to 658. For drilling templates, see page 598.

EXTRA HEAVY

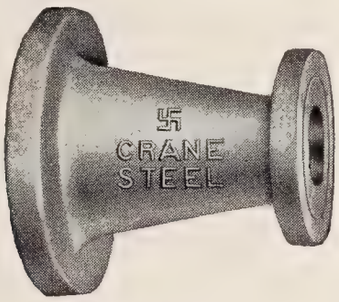
CAST STEEL FLANGED FITTINGS

FOR STEAM WORKING PRESSURES UP TO 350 POUNDS AND A TOTAL TEMPERATURE OF 800 DEGREES

FOR 500 POUNDS WATER WORKING PRESSURES

STEEL BOLTS OF HIGH TENSILE STRENGTH or commercial bolts larger in diameter must be used on the end flanges when these fittings are subjected to steam working pressures in excess of 300 pounds.

A. S. M. E. EXTRA HEAVY BOLTING using commercial bolts is not strong enough for steam working pressures in excess of 300 pounds.



FLANGED TAPER REDUCERS
No. 123 D
CODE: MIGAJICAS

FLANGED ECCENTRIC TAPER REDUCERS
No. 123½ D
CODE: MILDGNADIG

No. 123 D. EXTRA HEAVY CAST STEEL FLANGED TAPER REDUCERS

Size Inches	Size Milli-meters	Faced Each	Faced, Drilled and Spot Faced Each	Size Inches	Size Milli-meters	Faced Each	Faced, Drilled and Spot Faced Each
3 x2	76x50	14.00	17.00	8x6	200x150	43.00	48.00
3½x2½	90x64	17.00	20.00	10x4	250x100	61.00	67.00
4 x2	100x 50	19.00	22.00	10x5	250x125	61.00	67.00
4 x2½	100x 64	19.00	22.00	10x6	250x150	61.00	67.00
4 x3	100x 76	19.00	22.00	10x8	250x200	61.00	67.00
5 x2	125x 50	24.00	27.00	12x5	300x125	77.00	84.00
5 x2½	125x 64	24.00	27.00	12x6	300x150	77.00	84.00
5 x3	125x 76	24.00	27.00	12x8	300x200	77.00	84.00
5 x4	125x100	24.00	27.00	12x10	300x250	77.00	84.00
6 x3	150x 76	29.00	33.00	14x6	350x150	100.00	108.00
6 x3½	150x 90	29.00	33.00	14x8	350x200	100.00	108.00
6 x4	150x100	29.00	33.00	14x10	350x250	100.00	108.00
6 x5	150x125	29.00	33.00	14x12	350x300	100.00	108.00
7 x3	175x 76	36.00	41.00	15x8	375x200	112.00	120.00
7 x4	175x100	36.00	41.00	15x10	375x250	112.00	120.00
7 x5	175x125	36.00	41.00	15x12	375x300	112.00	120.00
7 x6	175x150	36.00	41.00	15x14	375x350	112.00	120.00
8 x3	200x 76	43.00	48.00	16x8	400x200	130.00	140.00
8 x4	200x100	43.00	48.00	16x10	400x250	130.00	140.00
8 x5	200x125	43.00	48.00	16x12	400x300	130.00	140.00
				16x14	400x350	130.00	140.00

Other sizes of the No. 123 D, and all sizes of the No. 123½ D prices on application.

The flanges of these Fittings are regularly furnished with a 1/16-inch raised face, for diameters, see page 665.

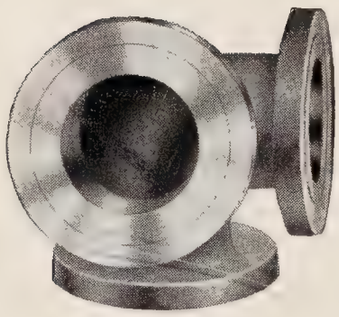
Flanged Taper Reducers in accordance with special dimensions made to order. Prices on application.

Templates for drilling, page 598.

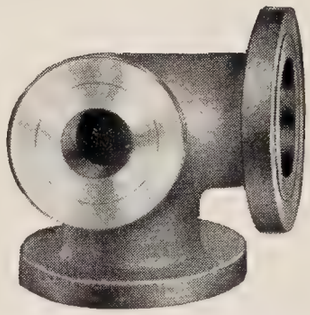
For General Dimensions, see pages 656 and 657.

EXTRA HEAVY CAST STEEL

FLANGED FITTINGS



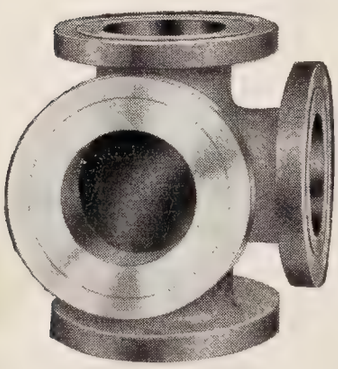
SIDE OUTLET FLANGED ELBOWS
No. 131 D
CODE: MINERVIULO



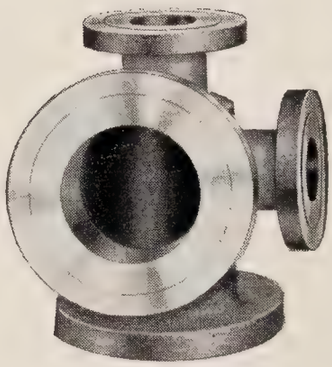
REDUCING SIDE OUTLET FLANGED ELBOWS
No. 133 D
CODE: MINORASCHI

DOUBLE BRANCH FLANGED ELBOWS
No. 139 D
CODE: MIRABILARY

REDUCING DOUBLE BRANCH FLANGED ELBOWS
No. 141 D
CODE: MIRTETWIJG



SIDE OUTLET FLANGED TEES
No. 135 D
CODE: MINORINGHI



REDUCING SIDE OUTLET FLANGED TEES
No. 137 D
CODE: MIQUELET

THE ABOVE FITTINGS IN SIZES 2 TO 24-INCH MADE TO ORDER ONLY

PRICES ON APPLICATION

Reducing Side Outlet Elbows are made reducing on the side outlet only. Double Branch Elbows are made reducing only on the run. When ordering or requesting prices, send sketch showing sizes of all openings.

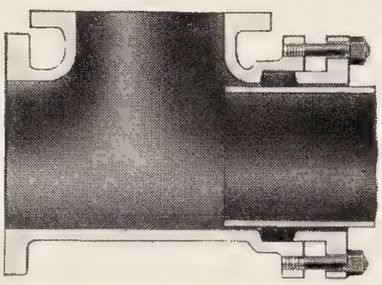
Dimensions, pages 656 and 657.

SPECIAL FLANGED FITTINGS

CAST IRON, FERROSTEEL OR CAST STEEL

LOW PRESSURE, STANDARD AND EXTRA HEAVY PATTERNS

DISTRIBUTING HEADER
CODE: MISCHOMANY



EXPANSION TEE FOR EXHAUST LINES ONLY
CODE: MISDADIGST

This Tee is furnished with Gland and Studs and is bored to take Wrought Pipe. Can be furnished with Brass Sleeve when so ordered.

CAST IRON PIPE WITH FLANGE AND SPIGOT

CODE: MISERUISSE

CAST IRON TEE WITH FLANGE AND HUB ON ENDS OF RUN AND SCREWED OUTLET

CODE: MISDRIJVEN

SPECIAL LENGTHS OF CAST IRON FLANGED PIPE

CODE: MISGEKEKEN

CAST IRON PIPE WITH FLANGE AND HUB

CODE: MISFARESTI

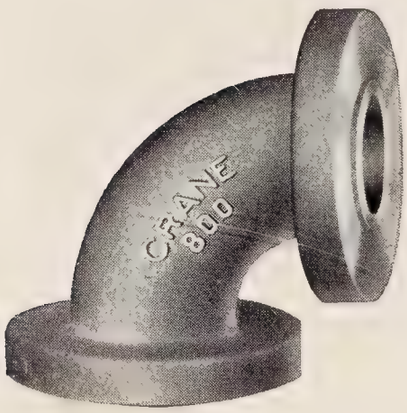
The above illustrations show a few of the many special patterns we are called upon to furnish. We have exceptional facilities for making any required designs and for all purposes.

PRICES ON APPLICATION

Dimension drawings should accompany orders or inquiries for prices.
See other designs of Special Flanged Fittings, page 420.

800 POUND
AMERICAN HYDRAULIC STANDARD FERROSTEEL FLANGED FITTINGS

TESTED TO 2000 POUNDS HYDROSTATIC PRESSURE



FLANGED ELBOW
No. 845-H

CODE: MISGEVAREN

45° FLANGED ELBOW
No. 846-H

CODE: MISKLEURD

Size	Size	Flanged Elbows No. 845-H		45° Flanged Elbows No. 846-H	
		Faced		Faced	
Inches	Millimeters	Each	Faced and Drilled	Each	Faced and Drilled
1½	38	15.00	17.00	15.00	17.00
2	50	17.00	19.00	17.00	19.00
2½	64	18.00	20.50	18.00	20.50
3	76	20.00	22.50	20.00	22.50
3½	90	22.50	26.00	22.50	26.00
4	100	26.00	30.00	26.00	30.00
4½	113	33.50	37.50	33.50	37.50
5	125	38.00	42.00	38.00	42.00
6	150	46.00	50.00	46.00	50.00
7	175	57.50	65.00	57.50	65.00
8	200	67.50	75.00	67.50	75.00
10	250	110.00	120.00	110.00	120.00
12	300	160.00	185.00	160.00	185.00

WORKING PRESSURES

These Fittings are suitable for 800 pounds working pressure when used in hydraulic installations in which shock is absent or so slight as to be negligible. WHEN SUBJECT TO SHOCK they are NOT recommended for these pressures. See explanatory notes on page 175.

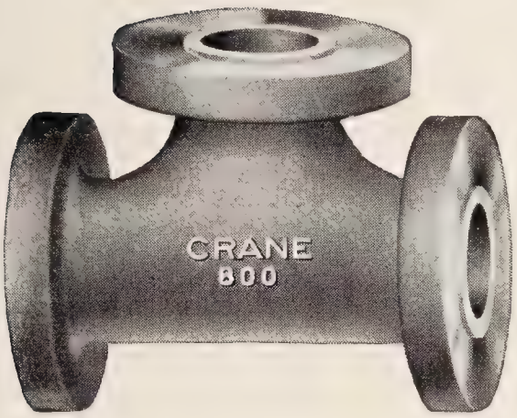
AIR OR GAS

Fittings for Air or Gas are SPECIAL. See explanatory notes on page 175.

For General Dimensions, see page 662.
For Drilling Templates, see page 599.

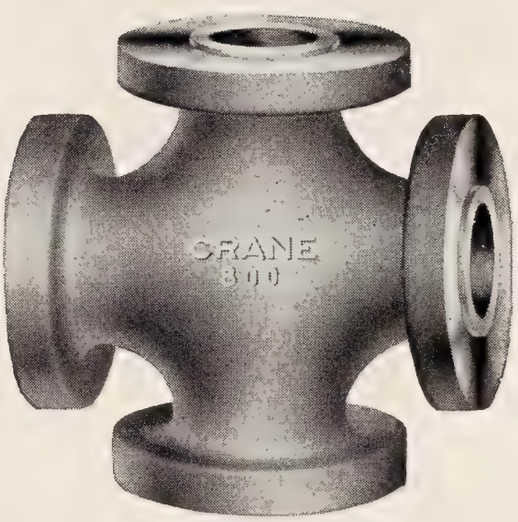
800 POUND
AMERICAN HYDRAULIC STANDARD FERROSTEEL FLANGED FITTINGS

TESTED TO 2000 POUNDS HYDROSTATIC PRESSURE



FLANGED TEE
No. 847-H

CODE: MISTAGOGIA



FLANGED CROSS
No. 849-H

CODE: MISURANZA

Size	Size	Flanged Tees No. 847-H		Flanged Crosses No. 849-H	
Inches	Millimeters	Faced Each	Faced and Drilled	Faced Each	Faced and Drilled
1½	38	20.00	22.50	28.50	31.50
2	50	22.50	25.00	32.00	35.00
2½	64	24.00	27.00	33.50	37.50
3	76	27.00	30.00	38.00	42.00
3½	90	30.00	35.00	43.00	49.00
4	100	35.00	40.00	49.00	55.00
4½	113	45.00	50.00	64.00	70.00
5	125	50.00	55.00	69.00	75.00
6	150	60.00	65.00	84.00	90.00
7	175	75.00	85.00	107.50	120.00
8	200	90.00	100.00	122.50	135.00
10	250	140.00	155.00	180.00	200.00
12	300	200.00	225.00	260.00	285.00

WORKING PRESSURES

These Fittings are suitable for 800 pounds working pressure when used in hydraulic installations in which shock is absent or so slight as to be negligible. WHEN SUBJECT TO SHOCK they are NOT recommended for these pressures. See explanatory notes on page 175.

AIR OR GAS

Fittings for Air or Gas are SPECIAL. See explanatory notes on page 175.

For General Dimensions, see page 662.
For Drilling Templates, see page 599.

800 POUND

AMERICAN HYDRAULIC STANDARD FERROSTEEL FLANGED FITTINGS

TESTED TO 2000 POUNDS HYDROSTATIC PRESSURE

45° FLANGED LATERAL
No. 851-H
CODE: MITCAVENT

FLANGED TAPER REDUCER
No. 853-H
CODE: MITGESUMMT

Size	Size	Flanged Lateral No. 851-H		Flanged Taper Reducer No. 853-H	
Inches	Millimeters	Faced Each	Faced and Drilled	Faced Each	Faced and Drilled
1½	38	40.00	43.00		
2	50	45.00	48.00	18.00	20.00
2½	64	60.00	64.00	20.00	22.50
3	76	70.00	74.00	22.50	25.00
3½	90	77.50	84.00	28.00	31.50
4	100	80.00	86.50	30.00	34.00
4½	113	85.00	92.00	37.50	42.00
5	125	90.00	97.00	40.00	44.00
6	150	95.00	104.00	45.00	50.00
7	175	125.00	138.00	60.00	67.50
8	200	150.00	165.00	70.00	77.50
10	250	225.00	245.00	110.00	120.00
12	300	325.00	350.00	170.00	185.00

WORKING PRESSURES

These Fittings are suitable for 800 pounds working pressure when used in hydraulic installations in which shock is absent or so slight as to be negligible. WHEN SUBJECT TO SHOCK they are NOT recommended for these pressures. See explanatory notes on page 175.

AIR OR GAS

Fittings for Air or Gas are SPECIAL. See explanatory notes on page 175.
For general dimensions, see page 662.
For drilling templates, see page 599.

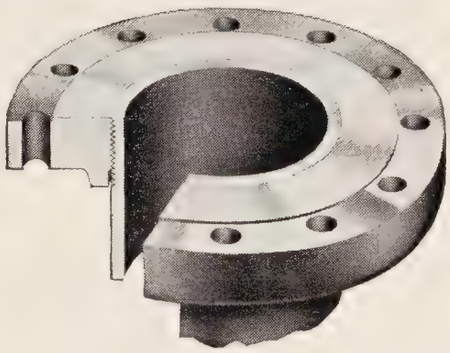
COMPANION FLANGES

Our Companion Flanges conform to the American Standard for 125 and 250 pounds working pressures and should not be confused with flange unions, shown elsewhere in this catalogue, which are sold in pairs, are lighter than Companion Flanges, have smaller diameters and drilling templates, and lighter bolting so that they can not be bolted to flanged valves or flanged fittings.

We manufacture Companion Flanges of the following types: Screwed, Shrink, Cranelap, and Craneweld; of Cast Iron, Ferrosteel, Malleable Iron, Cast Steel, and Forged Steel; except that the Craneweld is made of Forged Steel only.

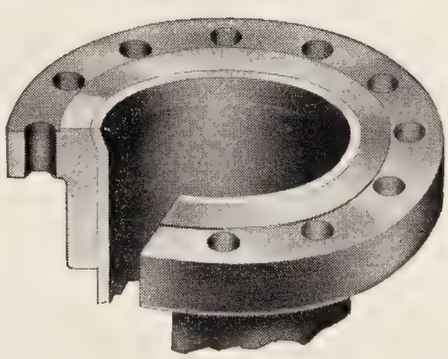
Our pipe shop is fully equipped with special machinery for flanging pipe with any of these types of flanges and we give below a brief description of the methods employed.

SCREWED COMPANION FLANGES



The Screwed Flange is the least expensive of the several types and when properly made on the pipe it gives universal satisfaction for Standard and Medium steam working pressures. It is our practice to thread both the flange and the pipe accurately to the American Briggs gauge, after which, the flanges are screwed on by powerful machinery until the end of the pipe projects beyond the face of the flange, which insures a metal to metal joint. The end of the pipe is then cut off flush with the face of the flange and a light refacing cut taken across both the end of the pipe and the face of the flange, bringing the face of the flange at 90 degrees with the center line of the pipe. When a flange applied and finished this way is bolted up, the gasket bears against the end of the pipe as well as the face of the flange.

SHRINK COMPANION FLANGES



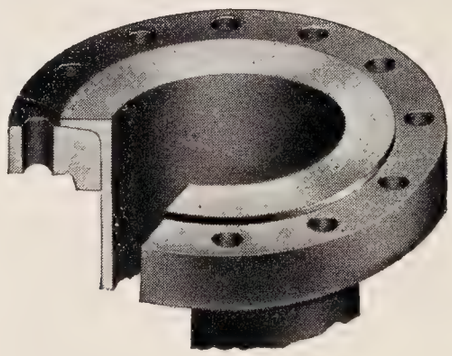
The Shrink Flange, previous to the introduction of the Lap and Weld types, was very popular for high pressure work because the thickness of the pipe was not reduced and the process of making on the pipe is comparatively simple. For this type of flange we true up the pipe, bore the flange to a shrink fit, and chamfer its bore. The flange is then heated to a red heat and while hot is slipped over the end of the pipe until the end of the pipe projects beyond the face of the flange.

(CONTINUED)

COMPANION FLANGES—CONCLUDED

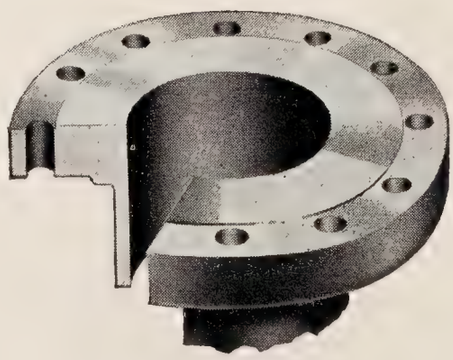
After the flange has partially cooled the end of the pipe is beaded into the chamfer and a light refacing cut is taken across both the end of the pipe and the face of the flange, bringing the face of the flange at 90 degrees with the center line of the pipe. In a joint made with this type of flange the gasket bears against the end of the pipe as well as the face of the flange.

CRANELAP COMPANION FLANGES



Our Cranelap Flange eliminates the defects of the ordinary lap joint. By the use of special machinery and a patented process we are able to make this with a square corner, which increases the amount of metal at the turn by about 75 per cent, and eliminates the water pocket always present in the old joint with round corners. The face of the flange is finished and the part of the face inside the bolt holes is finished to the same angle as the back side of the pipe which has been flanged over. The hub of the flange is bored slightly larger than the outside diameter of the pipe so that the flange will swivel readily and accommodate itself to any slight variation in the position of the bolt holes. The flanged portion of the pipe is finished on the edge and the face finished smooth.

CRANEWELD COMPANION FLANGES



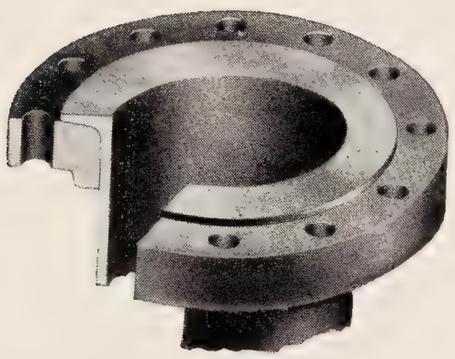
Our Craneweld Flange is attached to the pipe by welding. The pipe and flange are heated to a welding heat, and the weld made by special machinery, which makes practically a hammer weld. The flange is then finished not only on the face, but also on the edge and back. This process gives an absolutely perfect union between the flange and the pipe, eliminating every possibility of leak between the flange and pipe. This joint should not be confused with that formed by the Oxy-acetylene or similar processes, which do not always result in a perfect union between the flange and the pipe.

FULL THICKNESS

CRANELAP JOINT

FOR

HIGH PRESSURE INSTALLATIONS



Crane Co. has developed a process for lapping pipe by means of which we are enabled to produce a joint far superior to lap joints now furnished for High Pressure work.

This lap joint is recommended for HIGH PRESSURE STEAM OR WATER installations where heavier weights of pipe are used to meet extreme service conditions.

The thickness in the pipe is maintained throughout the lap; in other words, the lap can be made much stronger than the pipe even after refacing for the gasket bearing surface.

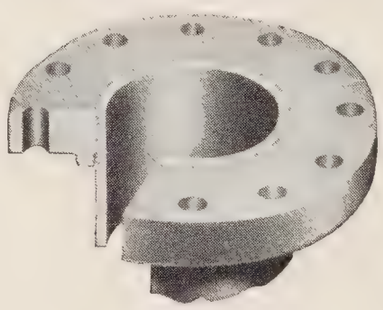
Prices will be quoted on application.

FACING OF FLANGES

There are various styles of finish used on the face of flanges which have for their purpose the retention of the gasket used to make a tight joint. Those in general use are as follows:

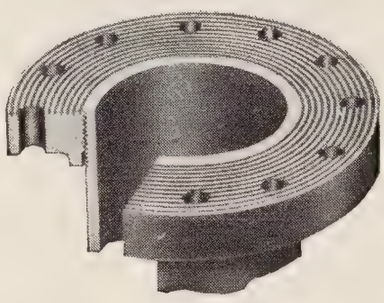
Plain Straight Face.
Plain Face, Corrugated or Scored.
Raised Face, Smooth Finish.
Male and Female.
Tongue and Groove.
Double Male.

PLAIN STRAIGHT FACE



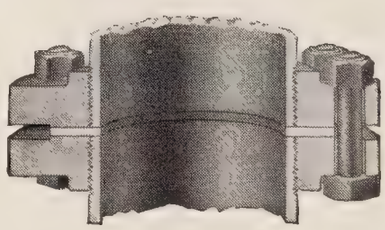
This type of facing has the entire face of the flange faced straight across and may be used with either a full face or ring gasket.

PLAIN FACE, CORRUGATED OR SCORED



This style of facing is a plain straight face, upon which concentric grooves have been cut with either a round nose or "V" shaped tool. This finish is sometimes of advantage where the service demands an exceptionally thick, loosely woven fibrous or soft metallic gasket, because the roughening of the faces of the flanges tends to keep the gasket from blowing out.

RAISED FACE, SMOOTH FINISH

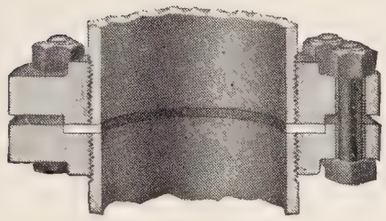


In this type of facing the portion of the face inside the bolt holes is finished smooth and $\frac{1}{16}$-inch higher than the rest of the face. The raised faces keep the outside edges of the flanges from meeting when the bolts are drawn up extremely tight and it is possible to get a greater compression per square inch of gasket surface than with a plain face and full face gasket.

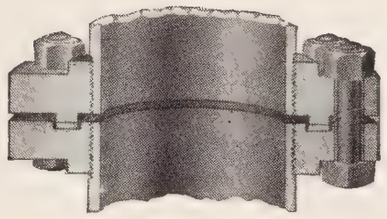
(CONTINUED)

FACING OF FLANGES—CONTINUED

MALE AND FEMALE TONGUE AND GROOVE



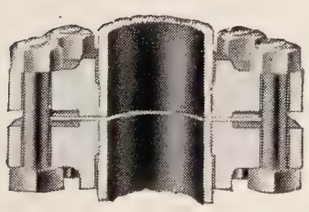
MALE AND FEMALE FACES



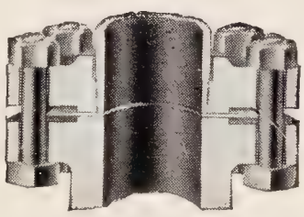
TONGUED AND GROOVED FACES

These facings have been extensively used, particularly on hydraulic lines, and to a more limited extent on high pressure steam lines. The Male and Female facing consists of a recess in one flange and a corresponding raised face or projection on the other, extending from the inside of the pipe nearly to the inside of the bolt holes. In the Tongue and Groove joint the tongue or raised face and the groove or recess are narrow rings located between the bolt holes and the port. Both of these types have, in common, several objectionable features. It is necessary that particular care be taken in facing each flange so that it will leave the shop either male or female as required to give proper mating when the material is erected. Frequently, through a misunderstanding between the shop and the customer, these facings are not furnished properly, which results in replacements, delays and inconvenience. Should a leak occur in a fitting furnished with either facing it is necessary to remove that fitting from the line to determine which flange was furnished male and which female, unless an accurate record has been kept. Further, if a fitting is to be replaced in a line it is necessary to spring the line apart to allow the fitting to be removed. These objections are all removed by the use of the following joint.

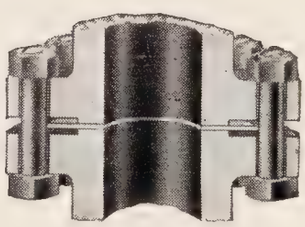
DOUBLE MALE



TWO COMPANION FLANGES



COMPANION FLANGE AND FITTING OR VALVE



TWO FITTINGS OR VALVES

This style of facing is a high, narrow, raised ring, whose inside diameter is the same as that of the pipe or port. It is particularly recommended for all high pressure hydraulic lines. Gaskets used in this type of joint are either soft, fibrous material or soft metal and extend from the inside of the pipe to the bolt holes, and only the small portion in contact with the narrow raised face is subjected to the compressive effect of the bolts. This facing is superior to either the male and female or tongue and groove for the following reasons:

(CONTINUED)

FACING OF FLANGES—CONCLUDED

It eliminates all mating of flanges, as they are all male.

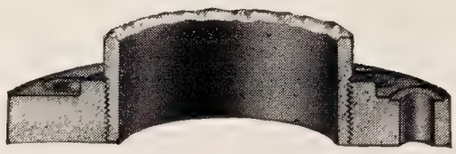
Any valve, fitting or piece of pipe may be removed from the line without springing the line apart.

The gasket is automatically centered by its outer edge coming in contact with the bolts.

The outside edges of the flanges are far enough apart to make it possible to determine whether the joint has been properly made.

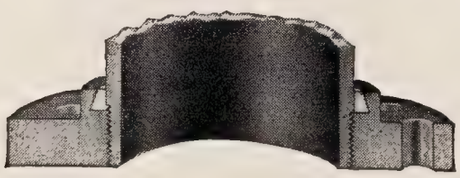
Where this type of facing is used on a valve, fitting or Craneweld flange, the projection is turned on the face of the flange. Where a screwed flange is used on Double Extra Strong pipe it is not always necessary to reface the flanges as the thickness of the pipe furnishes sufficient area for the gasket bearing. When Cranelap flanges are furnished double male, the outside diameters of the flanged over portion of the pipe are smaller than the regular Cranelap joint.

SPOT FACED BOLT HOLES



For high pressure work, particularly where semi-finished bolts and nuts are used, it is desirable to have a better bearing surface for the bolts and nuts than can be obtained with rough castings. This is secured by finishing a bearing surface around each bolt hole on the back of the flange.

CALKING RECESS FOR FLANGES



Calking recesses can be bored in extra heavy flanges in sizes 2 to 24-inch, inclusive. This recess will vary from $\frac{3}{8}$ to $\frac{1}{2}$-inch in depth, according to size, is $\frac{1}{4}$-inch wide at the top and $\frac{5}{16}$-inch at the bottom. For cold water lines these recesses are calked with lead; for steam lines with soft copper.

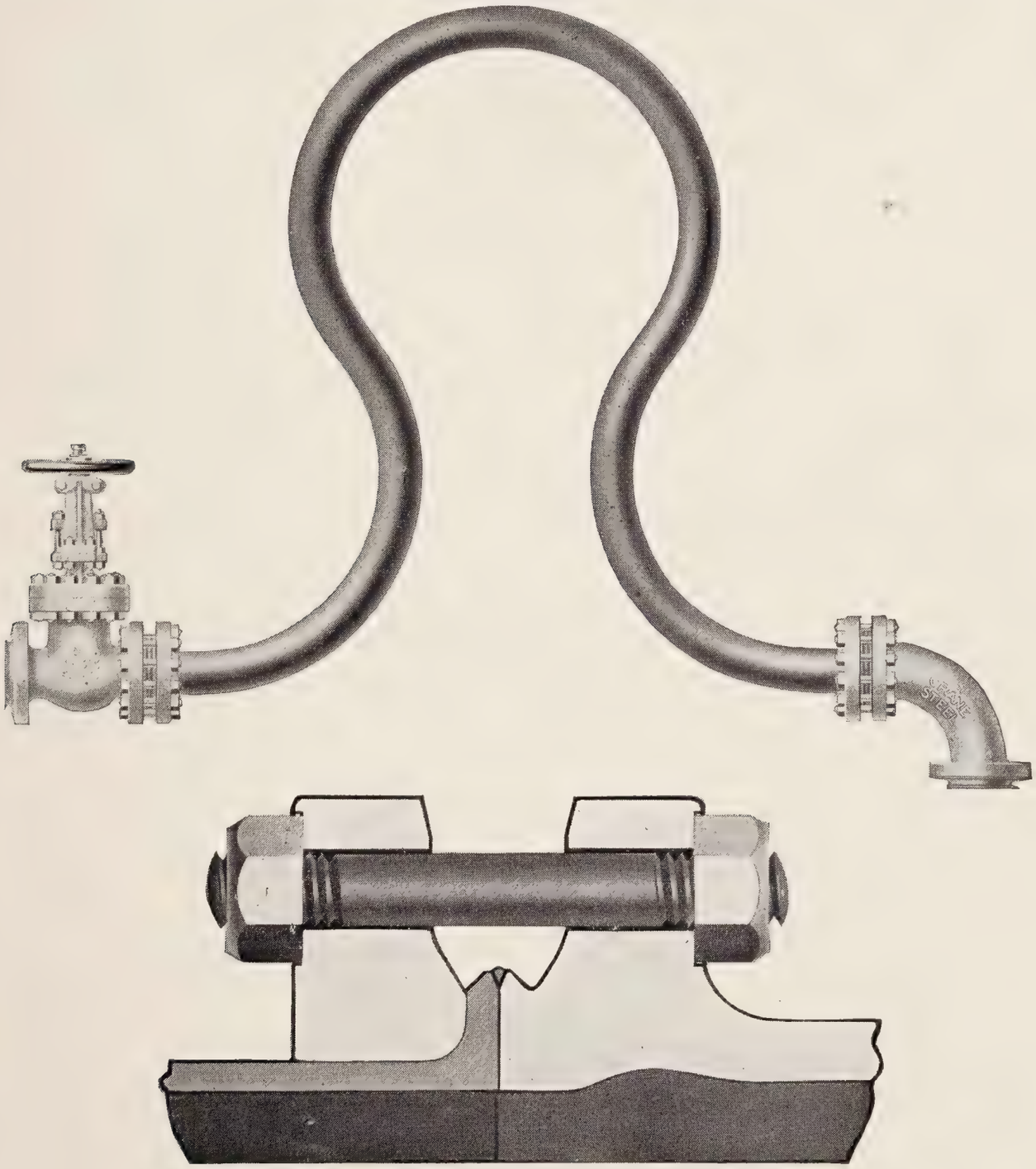
THE SARGOL JOINT

FOR MAKING WELDED FLANGE JOINTS

(PATENTED)

The Sargol Joint has a V shaped recess at the junction of flange faces and thus provides a means of welding flange joints as shown in the illustration on this page.

We are equipped to manufacture Valves and Fittings, Fabricated Piping and Pipe Bends with the flanges machined to make the "Sargol Joint."



THIS STYLE OF JOINT IS PATENTED AND THOSE WHO WISH TO USE IT SHOULD ARRANGE WITH THE OWNERS OF THE PATENT

FULL THICKNESS CRANELAP JOINTS

Full thickness Crane Lap Joints shown on page 465, are particularly adaptable for Welded Joints, as ample metal is provided for the welding lip and the strength of the lap is more than sufficient to meet the strains imposed by welding and bolting up.

COMMON FLANGES

CAST IRON

NOT FACED

CODE: MITPAUKEND

Size Inches	Price Each	Size Inches	Price Each	Size Inches	Price Each
¾x4	.22	4 x 8½	1.00	7 x13½	2.80
1¼x4½	.25	3 x 9	1.15	8 x13½	2.80
¾x5	.30	3½x 9	1.15	6 x14	3.25
1 x5	.30	4 x 9	1.15	7 x14	3.25
1¼x5	.30	4½x 9	1.15	8 x14	3.25
1½x5	.30	4½x9¼	1.25	7 x15	4.00
1 x6	.42	3½x10	1.50	8 x15	4.00
1¼x6	.40	4 x10	1.50	9 x15	4.00
1½x6	.40	4½x10	1.50	8 x16	5.00
2 x6	.42	5 x10	1.50	9 x16	5.00
2½x6	.42	6 x10	1.50	10 x16	5.00
2 x6½	.50	4½x11	1.75	9 x17	5.75
2½x6½	.50	5 x11	1.75	10 x17	5.75
3 x6½	.50	6 x11	1.75	10 x18	7.00
2 x7	.62	5 x12	2.20	12 x18	7.00
2½x7	.62	6 x12	2.20	10 x19	7.50
3 x7	.62	7 x12	2.20	12 x19	7.50
3 x7½	.75	5 x12½	2.20	12 x20	8.50
2 x8	.90	6 x12½	2.20	14 x20	8.50
2½x8	.90	7 x12½	2.20	14 x21	9.50
3 x8	.90	6 x13	2.80	15 x21	9.50
3½x8	.90	7 x13	2.80	15 x22¼	14.00
4 x8	.90	8 x13	2.80	16 x23½	18.00
3½x8½	1.00	6 x13½	2.80		

Sizes 14-inch and larger are to be used with O. D. Pipe.

The above is considered a complete list. Other sizes made to order.

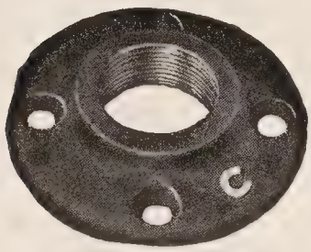
FOR STANDARD SCREWED COMPANION FLANGES, FACED AND DRILLED, SEE PAGE 472.

FLOOR FLANGES

CAST IRON

COUNTERSUNK HOLES FOR SCREWS

NOT FACED



CODE: MIXOGAMOUS

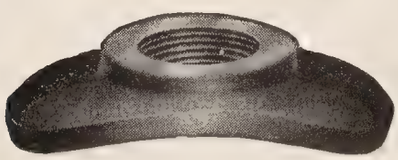
P. C. LIST

Size.....Inches	3/8x3	1/2x3 1/2	3/4x3 1/2	1x4	1 1/4x4	1 1/2x4 1/2	2x5 1/2
Price, Black.....Each	.20	.30	.32	.34	.44	.60	.70

Add 50 per cent to above prices for Galvanized Floor Flanges.

CIRCULAR FLANGES

CAST IRON



CODE: MOAPHERNES

Size of Pipe.....Inches	1 1/2	2	2 1/2	3	4	5
Size of Pipe.....Millimeters	38	50	64	76	100	125
Diameter of Flange.....Inches	6	7	8	9	9	11
Size of Pipe.....Inches	6	7	8	9	10	12
Size of Pipe.....Millimeters	150	175	200	225	250	300
Diameter of Flange.....Inches	12	13	14	17	18	20

These Flanges being made to order, it is always necessary to give the circle they are to fit.

Patterns for Circular Flanges are so constructed that the bosses for pipe can be put on any size flange on the table above, thereby increasing the variety of sizes and diameters to meet the circumstance.

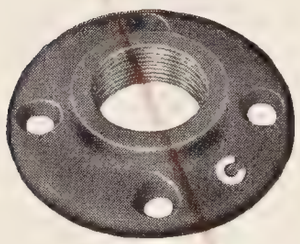
Prices on application.

FLOOR FLANGES

CAST IRON

COUNTERSUNK HOLES FOR SCREWS

NOT FACED

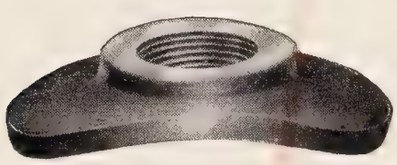


CODE: MIXOGAMOUS

Size.....Inches	3/8x3	1/2x3 1/2	3/4x3 1/2	1x4	1 1/4x4	1 1/2x4 1/2	2x5 1/2
Price.....Each	.10	.15	.15	.16	.16	.22	.35
Price, Galv.....Each	.20	.30	.30	.32	.32	.44	.70

CIRCULAR FLANGES

CAST IRON



CODE: MOAPHERNES

Size of Pipe.....Inches	1 1/2	2	2 1/2	3	4	5
Size of Pipe.....Millimeters	38	50	64	76	100	125
Diameter of Flange.....Inches	6	7	8	9	9	11
Size of Pipe.....Inches	6	7	8	9	10	12
Size of Pipe.....Millimeters	150	175	200	225	250	300
Diameter of Flange.....Inches	12	13	14	17	18	20

These Flanges being made to order, it is always necessary to give the circle they are to fit.

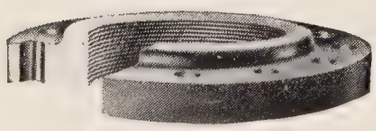
Patterns for Circular Flanges are so constructed that the bosses for pipe can be put on any size flange on the table above, thereby increasing the variety of sizes and diameters to meet the circumstance.

Prices on application.

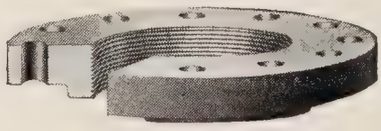
STANDARD COMPANION FLANGES

CAST IRON, FERROSTEEL, CAST STEEL, FORGED STEEL AND MALLEABLE IRON

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS



BACK VIEW, SHOWING HUB



SMOOTH FACE

CODE: MOCUAQUIM

Size	No. 553 Cast Iron		No. 558 Ferrosteel		No. 559 Malleable Iron		No. 560 Cast Steel		No. 556 Forged Steel		Threading Pipe, Making On and Refacing not Including Flange
	Faced	Faced and Drilled	Faced	Faced and Drilled	Faced	Faced and Drilled	Faced	Faced, Drilled & Spot Faced	Faced	Faced and Drilled	
Inches	Each	Each	Each	Each	Each	Each	Each	Each	Each	Each	Each
1x4	.55	.80	.70	1.00					7.50	8.00	1.45
1¼x4½	.60	.85	.75	1.05					8.40	9.00	1.45
1½x5	.65	.90	.80	1.10					9.40	10.00	1.60
2x6	.75	1.00	.95	1.25	1.50	2.00			10.40	11.00	1.75
2½x7	.85	1.10	1.05	1.35	1.70	2.20			11.80	13.00	1.95
3x7½	.95	1.25	1.20	1.55	1.90	2.50			13.70	15.00	2.15
3½x8½	1.20	1.55	1.50	1.95	2.40	3.10			17.60	19.00	2.35
4x9	1.35	1.80	1.70	2.25	2.70	3.60			18.30	20.00	2.50
4½x9¼	1.45	1.90	1.80	2.35	2.90	3.80			20.30	22.00	2.70
5x10	1.60	2.05	2.00	2.55	3.20	4.10			22.30	24.00	3.05
6x11	2.00	2.50	2.50	3.10	4.00	5.00			25.40	27.00	3.60
7x12½	2.65	3.25	3.30	4.05	5.30	6.50			27.20	32.00	3.95
8x13½	3.10	3.80	3.90	4.75	6.20	7.60			32.00	35.00	4.65
9x15	3.85	4.65	4.80	5.80	7.70	9.30			37.00	40.00	5.55
10x16	4.50	5.50	5.65	6.85	9.00	11.00			45.00	48.00	6.10
12x19	6.50	7.65	8.15	9.55	13.00	15.30			56.00	60.00	8.60
14x21	9.00	10.35	11.25	13.00	18.00	20.70	55.50	63.00	75.50	80.00	11.10
15x21	11.50	13.20	14.50	16.50	23.00	26.40	64.00	74.00			11.10
15x22¼	11.50	13.20	14.50	16.50	23.00	26.40	64.00	74.00			11.65
16x23½	13.50	15.30	17.00	19.00	27.00	30.60	78.00	89.00			15.25
18x25	16.00	18.00	20.00	22.50			98.00	110.00			22.35
20x27½	19.00	21.50	24.00	27.00			117.00	130.00			26.85
22x29½	22.00	25.00	27.50	31.00			140.00	155.00			30.50
24x32	27.00	30.50	34.00	38.00			165.00	180.00			35.75

*Cast Steel Flanges, when ordered faced and drilled, will always be furnished with bolt holes spot faced at the prices given above.

Cast Steel and Forged Steel Flanges are furnished with 1/16-inch raised face, unless otherwise ordered. Other Standard Flanges are furnished smooth faced. All Flanges furnished faced only, unless otherwise ordered.

Standard Cast Steel Shrink Flanges made to order. Prices on application.

Special Eccentric Flanges, page 420.

For general dimensions, see page 663.

For drilling templates, see page 596.

Spot Facing Bolt Holes, list price, 10 cents per hole.

Sizes 14-inch and larger are tapped to be used with O. D. Pipe of the same sizes.

Cast Steel Flanges, sizes 1-inch to 12-inch inclusive, can be furnished when so ordered. Prices on application.

No 557

CODE: MOLLEJUELA

STANDARD REDUCING COMPANION FLANGES

CAST IRON WITH RIBS

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS

Size	No. 557		Size	No. 557		Size	No. 557	
Inches	Faced Each	Faced and Drilled, Each	Inches	Faced Each	Faced and Drilled, Each	Inches	Faced Each	Faced and Drilled, Each
1x6	1.30	1.55	4x12½	4.40	5.00	5x19	10.75	11.90
1¼x6	1.30	1.55	4½x12½	4.40	5.00	6x19	10.75	11.90
1½x6	1.30	1.55	5x12½	4.40	5.00	7x19	10.75	11.90
1½x7	1.45	1.70	6x12½	4.40	5.00	8x19	10.75	11.90
2x7	1.45	1.70	1½x13½	5.10	5.80	9x19	10.75	11.90
1½x7½	1.55	1.85	2x13½	5.10	5.80	10x19	10.75	11.90
2x7½	1.55	1.85	2½x13½	5.10	5.80	4x21	15.00	16.35
2½x7½	1.55	1.85	3x13½	5.10	5.80	5x21	15.00	16.35
1½x8½	2.00	2.35	3½x13½	5.10	5.80	6x21	15.00	16.35
2x8½	2.00	2.35	4x13½	5.10	5.80	7x21	15.00	16.35
2½x8½	2.00	2.35	5x13½	5.10	5.80	8x21	15.00	16.35
3x8½	2.00	2.35	6x13½	5.10	5.80	9x21	15.00	16.35
1½x9	2.20	2.65	7x13½	5.10	5.80	10x21	15.00	16.35
2x9	2.20	2.65	1½x15	6.35	7.15	12x21	15.00	16.35
2½x9	2.20	2.65	2x15	6.35	7.15	8x22¼	19.00	20.70
3x9	2.20	2.65	2½x15	6.35	7.15	10x22¼	19.00	20.70
3½x9	2.20	2.65	3x15	6.35	7.15	12x22¼	19.00	20.70
1½x9¼	2.40	2.85	3½x15	6.35	7.15	14x22¼	19.00	20.70
2x9¼	2.40	2.85	4x15	6.35	7.15	6x23½	22.00	23.80
2½x9¼	2.40	2.85	4½x15	6.35	7.15	8x23½	22.00	23.80
3x9¼	2.40	2.85	5x15	6.35	7.15	10x23½	22.00	23.80
3½x9¼	2.40	2.85	6x15	6.35	7.15	12x23½	22.00	23.80
4x9¼	2.40	2.85	7x15	6.35	7.15	14x23½	22.00	23.80
1½x10	2.65	3.10	8x15	6.35	7.15	15x23½	22.00	23.80
2x10	2.65	3.10	1½x16	7.45	8.45	6x25	26.50	28.50
2½x10	2.65	3.10	2x16	7.45	8.45	8x25	26.50	28.50
3x10	2.65	3.10	2½x16	7.45	8.45	10x25	26.50	28.50
3½x10	2.65	3.10	3x16	7.45	8.45	12x25	26.50	28.50
4x10	2.65	3.10	3½x16	7.45	8.45	14x25	26.50	28.50
4½x10	2.65	3.10	4x16	7.45	8.45	15x25	26.50	28.50
1½x11	3.30	3.80	4½x16	7.45	8.45	16x25	26.50	28.50
2x11	3.30	3.80	5x16	7.45	8.45	14x27½	31.00	33.50
2½x11	3.30	3.80	6x16	7.45	8.45	15x27½	31.00	33.50
3x11	3.30	3.80	7x16	7.45	8.45	16x27½	31.00	33.50
3½x11	3.30	3.80	8x16	7.45	8.45	18x27½	31.00	33.50
4x11	3.30	3.80	9x16	7.45	8.45	15x29½	36.00	39.00
4½x11	3.30	3.80	1½x19	10.75	11.90	16x29½	36.00	39.00
5x11	3.30	3.80	2x19	10.75	11.90	18x29½	36.00	39.00
1½x12½	4.40	5.00	2½x19	10.75	11.90	20x29½	36.00	39.00
2x12½	4.40	5.00	3x19	10.75	11.90	14x32	44.00	47.50
2½x12½	4.40	5.00	3½x19	10.75	11.90	16x32	44.00	47.50
3x12½	4.40	5.00	4x19	10.75	11.90	18x32	44.00	47.50
3½x12½	4.40	5.00	4½x19	10.75	11.90	20x32	44.00	47.50

MADE TO ORDER OF FERROSTEEL AT AN ADVANCE OF 25 PER CENT

When ordering, see Notes on page 716.
Furnished smooth face and not drilled, unless otherwise specified.
Special Eccentric Flanges, page 420.
For general dimensions, see page 663.
Sizes 14-inch and larger are tapped to be used with O. D. pipe of the same sizes.
For drilling templates, see page 596.
Spot Facing Bolt Holes, list price, 10 cents per hole.

EXTRA HEAVY COMPANION FLANGES

CAST IRON, FERROSTEEL AND MALLEABLE IRON FOR SATURATED STEAM WORKING PRESSURES UP TO 250 POUNDS

FOR SUPERHEATED RATING OF FERROSTEEL, SEE PAGE 435.

CAST STEEL AND FORGED STEEL FOR SUPERHEATED STEAM WORKING PRESSURES UP TO 350 POUNDS

STEEL BOLTS OF HIGH TENSILE STRENGTH or commercial bolts larger in diameter must be used on flanges when they are subjected to steam working pressures in excess of 300 lbs.

A. S. M. E. EXTRA HEAVY BOLTING using commercial bolts is not strong enough for steam working pressures in excess of 300 lbs.

BACK VIEW, SHOWING HUB

CODE: MORBIFICAL

RAISED FACE

Size Inches	No. 151 E Cast Iron		No. 251 E Ferrosteel		No. 271 E Mal'ble Iron		No. 281 D Cast Steel		No. 291 E Forged Steel		Thr'ding Pipe, Making and refacing not including flange Each
	Faced Each	Faced and Drl'd Each	Faced Each	Faced and Drl'd Each	Faced Each	Faced and Drl'd Each	Faced Each	* Faced Dril'd & Spot Faced Each	Faced Each	Faced and Drilled Each	
1x4½	.95	1.30	1.20	1.65					7.50	8.00	2.15
1¼x5	1.00	1.35	1.25	1.70					8.40	9.00	2.15
1½x6	1.10	1.45	1.35	1.80	2.20	2.90			9.40	10.00	2.35
2x6½	1.25	1.60	1.55	2.00	2.50	3.20			10.40	11.00	2.50
2½x7½	1.40	1.75	1.75	2.20	2.80	3.50			11.80	13.00	2.70
3x8¼	1.60	2.05	2.00	2.55	3.20	4.10			13.70	15.00	3.05
3½x9	2.00	2.55	2.50	3.20	4.00	5.10			17.60	19.00	3.25
4x10	2.25	2.95	2.80	3.70	4.50	5.90			18.30	20.00	3.40
4½x10½	2.40	3.10	3.00	3.90	4.80	6.20			20.30	22.00	3.60
5x11	2.65	3.35	3.30	4.20	5.30	6.70			22.30	24.00	3.95
6x12½	3.30	4.05	4.10	5.05	6.60	8.10			25.40	27.00	4.50
7x14	4.40	5.30	5.50	6.60	8.80	10.60			27.20	32.00	4.80
8x15	5.10	6.15	6.40	7.70	10.20	12.30			32.00	35.00	5.55
9x16¼	6.30	7.50	7.90	9.40	12.60	15.00			37.00	40.00	6.40
10x17½	7.40	8.90	9.25	11.00	14.80	17.80			45.00	48.00	7.15
12x20½	10.75	12.50	13.50	15.50	21.50	25.00			56.00	60.00	9.85
14x23	15.00	17.00	18.50	21.00	30.00	34.00	55.50	65.00	75.50	80.00	12.50
15x24½	19.00	21.50	24.00	27.00	38.00	43.00	64.00	57.00	84.00	90.00	13.40
16x25½	22.25	25.00	28.00	31.00	44.50	50.00	78.00	90.00	93.00	100.00	17.00
18x28	26.00	29.00	32.50	36.00			98.00	111.00	118.00	125.00	25.00
20x30½	31.00	35.00	39.00	44.00			117.00	131.00	142.00	150.00	29.50
22x33	36.00	41.00	45.00	51.00			140.00	157.50			34.00
24x36	45.00	50.00	56.00	62.00			165.00	182.00			40.00

Furnished faced only, unless otherwise ordered.

*Cast Steel Flanges when ordered faced and drilled, will always be furnished with bolt holes spot faced, at the prices given above.

Sizes 14-inch and larger are tapped to be used with O. D. pipe of the same sizes.

Cast Steel Flanges, sizes 1-inch to 12-inch, inclusive, can be furnished when so ordered. Prices on application.

Special Eccentric Flanges, page 420.

For general dimensions, see page 664.

For drilling templates, see page 598.

Spot Facing Bolt Holes, list price, 10 cents per hole.

No. 155E
CODE: MORSCHGRAU

EXTRA HEAVY REDUCING COMPANION FLANGES

CAST IRON WITH RIBS

FOR SATURATED STEAM WORKING PRESSURES UP TO 250 LBS.
FOR SUPERHEATED STEAM RATING OF FERROSTEEL,
SEE PAGE 435.

Size	No. 155E		Size	No. 155E		Size	No. 155E	
	Faced	Faced and Drilled		Faced	Faced and Drilled		Faced	Faced and Drilled
Inches	Each	Each	Inches	Each	Each	Inches	Each	Each
1¼x6	1.80	2.15	5x12½	5.50	6.25	3x20½	17.50	19.25
1½x6½	2.10	2.45	2x14	7.25	8.15	3½x20½	17.50	19.25
1½x7½	2.30	2.65	2½x14	7.25	8.15	4x20½	17.50	19.25
2x7½	2.30	2.65	3x14	7.25	8.15	5x20½	17.50	19.25
1½x8¼	2.65	3.10	3½x14	7.25	8.15	6x20½	17.50	19.25
2x8¼	2.65	3.10	4x14	7.25	8.15	7x20½	17.50	19.25
2½x8¼	2.65	3.10	4½x14	7.25	8.15	8x20½	17.50	19.25
1½x9	3.30	3.85	5x14	7.25	8.15	9x20½	17.50	19.25
2x9	3.30	3.85	6x14	7.25	8.15	10x20½	17.50	19.25
2½x9	3.30	3.85	1½x15	8.40	9.45	6x23	25.00	27.00
3x9	3.30	3.85	2x15	8.40	9.45	8x23	25.00	27.00
1½x10	3.70	4.40	2½x15	8.40	9.45	9x23	25.00	27.00
2x10	3.70	4.40	3x15	8.40	9.45	10x23	25.00	27.00
2½x10	3.70	4.40	3½x15	8.40	9.45	12x23	25.00	27.00
3x10	3.70	4.40	4x15	8.40	9.45	8x24½	31.50	34.00
3½x10	3.70	4.40	4½x15	8.40	9.45	10x24½	31.50	34.00
1½x10½	4.00	4.70	5x15	8.40	9.45	12x24½	31.50	34.00
2x10½	4.00	4.70	6x15	8.40	9.45	14x24½	31.50	34.00
2½x10½	4.00	4.70	7x15	8.40	9.45	10x25½	37.00	39.75
3x10½	4.00	4.70	3x16¼	10.50	11.70	12x25½	37.00	39.75
3½x10½	4.00	4.70	4x16¼	10.50	11.70	14x25½	37.00	39.75
4x10½	4.00	4.70	5x16¼	10.50	11.70	15x25½	37.00	39.75
1½x11	4.40	5.10	6x16¼	10.50	11.70	12x28	43.00	46.00
2x11	4.40	5.10	7x16¼	10.50	11.70	14x28	43.00	46.00
2½x11	4.40	5.10	8x16¼	10.50	11.70	15x28	43.00	46.00
3x11	4.40	5.10	2x17½	12.00	13.50	16x28	43.00	46.00
3½x11	4.40	5.10	2½x17½	12.00	13.50	14x30½	51.00	55.00
4x11	4.40	5.10	3x17½	12.00	13.50	15x30½	51.00	55.00
4½x11	4.40	5.10	4x17½	12.00	13.50	16x30½	51.00	55.00
1½x12½	5.50	6.25	5x17½	12.00	13.50	18x30½	51.00	55.00
2x12½	5.50	6.25	6x17½	12.00	13.50	16x33	60.00	65.00
2½x12½	5.50	6.25	7x17½	12.00	13.50	18x33	60.00	65.00
3x12½	5.50	6.25	8x17½	12.00	13.50	20x33	60.00	65.00
4x12½	5.50	6.25	9x17½	12.00	13.50	18x36	74.00	79.00
4½x12½	5.50	6.25	2½x20½	17.50	19.25	20x36	74.00	79.00

When ordering, see notes on page 719.
Furnished faced only, unless otherwise ordered.
MADE TO ORDER OF FERROSTEEL (No. 255E), AT AN ADVANCE OF 25 PER CENT.
Special Eccentric Flanges, page 420.
For general dimensions, see page 664.
For drilling templates, see page 598.
Sizes 14-inch and larger are Tapped to be used with O. D. Pipe of the same sizes.
Spot facing bolt holes, list price 10 cents per hole.

EXTRA HEAVY CAST STEEL

REDUCING COMPANION FLANGES

WITH RIBS

No. 282D

FOR SUPERHEATED STEAM WORKING PRESSURES UP TO 350 POUNDS

CODE: MOTRIGLIA

STEEL BOLTS OF HIGH TENSILE STRENGTH or commercial bolts larger in diameter must be used on flanges when they are subjected to steam working pressures in excess of 300 pounds.

A. S. M. E. EXTRA HEAVY BOLTING using commercial bolts is not strong enough for steam working pressures in excess of 300 pounds.

Size Inches	Faced Each	* Faced, Drilled and Spot Faced Each	Size Inches	Faced Each	* Faced, Drilled and Spot Faced Each	Size Inches	Faced Each	* Faced, Drilled and Spot Faced Each
1¼x6	8.85	10.45	3x12½	30.90	35.50	10x20½	70.00	78.00
1½x6½	10.25	11.85	4x12½	30.90	35.50	8x23	85.00	95.00
1½x7½	10.80	13.00	4½x12½	30.90	35.50	9x23	85.00	95.00
2x7½	10.80	13.00	5x12½	30.90	35.50	10x23	85.00	95.00
1½x8¼	12.70	16.00	4½x14	36.70	42.50	12x23	85.00	95.00
2x8¼	12.70	16.00	5x14	36.70	42.50	8x24½	94.00	105.00
2½x8¼	12.70	16.00	6x14	36.70	42.50	10x24½	94.00	105.00
2x9	18 10	21.50	3x15	40.00	46.00	12x24½	94.00	105.00
2½x9	18.10	21.50	3½x15	40.00	46.00	14x24½	94.00	105.00
3x9	18.10	21.50	4x15	40.00	46.00	10x25½	115.00	127.00
2x10	21.80	25.50	5x15	40.00	46.00	12x25½	115.00	127.00
2½x10	21.80	25.50	6x15	40.00	46.00	14x25½	115.00	127.00
3x10	21.80	25.50	7x15	40.00	46.00	15x25½	115.00	127.00
3½x10	21.80	25.50	4x16¼	44.00	50.00	12x28	145.00	158.00
2x10½	23.80	27.50	5x16¼	44.00	50.00	14x28	145.00	158.00
2½x10½	23.80	27.50	6x16¼	44.00	50.00	15x28	145.00	158.00
3x10½	23.80	27.50	7x16¼	44.00	50.00	16x28	145.00	158.00
3½x10½	23.80	27.50	8x16¼	44.00	50.00	14x30½	175.00	189.00
4x10½	23.80	27.50	5x17½	52.00	59.00	15x30½	175.00	189.00
2x11	24.80	28.50	6x17½	52.00	59.00	16x30½	175.00	189.00
2½x11	24.80	28.50	7x17½	52.00	59.00	18x30½	175.00	189.00
3x11	24.80	28.50	8x17½	52.00	59.00	16x33	210.00	227.00
3½x11	24.80	28.50	9x17½	52.00	59.00	18x33	210.00	227.00
4x11	24.80	28.50	6x20½	70.00	78.00	20x33	210.00	227.00
4½x11	24.80	28.50	7x20½	70.00	78.00	18x36	250.00	267.00
2x12½	30.90	35.50	8x20½	70.00	78.00	20x36	250.00	267.00
2½x12½	30.90	35.50	9x20½	70.00	78.00			

Sizes 14-inch and larger are tapped to be used with O. D. Pipe of the same sizes.

*Cast Steel Reducing Companion Flanges when ordered faced and drilled, will always be furnished with spot faced bolt holes at the prices given above.

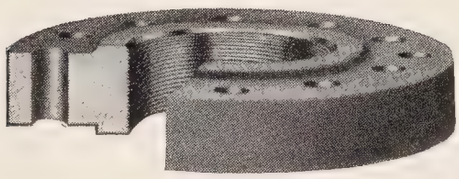
Special Eccentric Flanges, page 420.

In ordering Reducing Companion Flanges, see remarks and instructions, page 719.

For general dimensions, see page 664.

For drilling templates, see page 598.

800 POUND
AMERICAN HYDRAULIC STANDARD
COMPANION FLANGES



CODE: MOVITIVA

Size	SCREWED						Threading Pipe Making on and Refacing, Not Including Flange	CRANELAP		CRANE WELD
	No. 855H Ferrosteel		No. 856H Cast Steel		No. 857H Forged Steel			Cast Steel Short Hub Spot Faced	Forged Steel Long Hub	Forged Steel
	Faced	Faced Drilled and Spot Faced	Faced	Faced Drilled and Spot Faced	Faced	Faced Drilled and Spot Faced				
Inches	Each	Each	Each	Each	Each	Each	Each	Each	Each	Each
1½x 6	3.00	3.25	7.00	7.50	8.75	9.75	3.05			
2 x 6¾	3.25	3.75	7.25	7.75	9.00	10.00	3.15			
2½x 7½	4.25	4.75	10.00	10.75	13.00	14.50	3.45			
3 x 8½	4.50	5.00	10.75	12.00	13.50	15.00	3.80			
3½x 9½	5.00	5.75	13.75	15.50	16.75	18.75	4.15			
4 x10¾	6.00	6.75	16.75	18.75	18.00	20.00	4.30	24.00	26.50	32.50
4½x11½	9.00	10.00	23.00	25.50	25.00	27.50	4.50	36.00	38.50	34.75
5 x13	11.00	12.00	30.00	33.50	35.75	39.75	4.90	43.25	48.00	39.75
6 x14	13.00	15.00	36.75	40.75	39.00	43.25	5.75	55.25	57.50	43.25
7 x15	15.00	17.00	39.00	43.50	41.00	45.50	6.05	62.50	62.50	49.25
8 x16½	17.50	20.00	44.50	49.25	46.75	51.75	7.00	66.00	66.00	56.50
10 x20	26.00	30.00	60.00	66.00	67.25	74.50	9.00	68.50	72.00	90.00
12 x22	36.00	40.00	73.50	81.50	84.00	92.50	12.50	90.00	102.00	138.00

Faced and Drilled Placed on Pipe and Refaced

WORKING PRESSURES

These Flanges are suitable for 800 pounds pressure when used in Hydraulic installations in which shock is absent or so slight as to be neglible. WHEN SUBJECT TO SHOCK they are NOT recommended for these pressures. See explanatory notes on page 175.

AIR OR GAS

Flanges for air or gas are SPECIAL. See explanatory notes on page 175

For general dimensions of Ferrosteel, see page 662.

For drilling templates, see page 599.

STANDARD

CAST IRON BLIND FLANGES

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS

16-INCH OUTSIDE DIAMETER AND SMALLER

No. 555
CODE: MUCKENENTE

19-INCH OUTSIDE DIAMETER AND LARGER

Size of Valve or Fitting and O. D. of Flange, Inches	Faced Each	Faced and Drilled, Each	Size of Valve or Fitting and O.D.of Flange, Inches	Faced Each	Faced and Drilled, Each
1x4			12x19	9.75	10.90
1¼x4½			14x21	13.50	14.85
1½x5			15x22¼	17.00	18.70
2x6	1.15	1.40	16x23½	20.00	21.80
2½x7	1.30	1.55	18x25	24.00	26.00
3x7½	1.40	1.70	20x27½	28.00	30.50
3½x8½	1.80	2.15	22x29½	33.00	36.00
4x9	2.00	2.45	24x32	40.00	43.50
4½x9¼	2.20	2.65	26x34¼	62.50	70.00
5x10	2.40	2.85	28x36½	77.50	85.00
6x11	3.00	3.50	30x38¾	90.00	100.00
7x12½	4.00	4.60	32x41¾	110.00	120.00
8x13½	4.60	5.30	34x43¾	122.50	135.00
9x15	5.75	6.55	36x46	137.50	150.00
10x16	6.75	7.75			

MADE TO ORDER OF FERROSTEEL AT AN ADVANCE OF 25 PER CENT

Furnished smooth face and not drilled, unless otherwise specified.

For drilling templates, see page 596.

Spot Facing Bolt Holes, list price, 10 cents per hole.

EXTRA HEAVY BLIND FLANGES

CAST IRON AND FERROSTEEL FOR SATURATED STEAM WORKING PRESSURES UP TO 250 POUNDS

FOR SUPERHEATED STEAM RATING OF FERROSTEEL, SEE PAGE 435.

CAST STEEL AND FORGED STEEL FOR SUPERHEATED STEAM WORKING PRESSURES UP TO 350 POUNDS

STEEL BOLTS OF HIGH TENSILE STRENGTH or commercial bolts larger in diameter must be used on flanges when they are subjected to steam working pressures in excess of 300 pounds.

A. S. M. E. EXTRA HEAVY BOLTING using commercial bolts is not strong enough for steam working pressures in excess of 300 pounds.

16¼-INCH OUTSIDE DIAMETER AND SMALLER

17½-INCH OUTSIDE DIAMETER AND LARGER

CODE: MUGILAMUS

Size of Valve or Fitting and O. D. of Flange	No. 153 E Cast Iron		No. 253 E Ferrosteel		No. 287 D Cast Steel		No. 297E Forged Steel	
	Faced	Faced and Drilled	Faced	Faced and Drilled	Faced	* Faced Drilled Spot Faced	Faced	Faced and Drilled
Inches	Each	Each	Each	Each	Each		Each	Each
1½x6	1.65	2.00	2.05	2.50				
2x6½	1.90	2.25	2.35	2.80			12.00	12.60
2½x7½	2.10	2.45	2.60	3.05			13.50	14.70
3x8¼	2.40	2.85	3.00	3.55			15.75	17.05
3½x9	3.00	3.55	3.75	4.45			20.25	21.65
4x10	3.35	4.05	4.20	5.10			22.00	23.70
4½x10½	3.60	4.30	4.50	5.40			24.50	26.20
5x11	4.00	4.70	5.00	5.90			26.50	28.20
6x12½	5.00	5.75	6.25	7.20			30.00	31.60
7x14	6.60	7.50	8.25	9.35	30.70	36.50		
8x15	7.65	8.70	9.60	10.90	34.00	40.00		
9x16¼	9.50	10.70	11.90	13.40	37.00	43.00		
10x17½	11.00	12.50	13.75	15.50	52.00	59.00		
12x20½	16.00	17.75	20.00	22.00	70.00	78.00		
14x23	22.50	24.50	28.00	30.50	85.00	95.00		
15x24½	28.50	31.00	35.50	38.50	94.00	105.00		
16x25½	33.50	36.25	42.00	45.00	115.00	127.00		
18x28	39.00	42.00	48.50	52.00	145.00	158.00		
20x30½	46.00	50.00	57.50	62.50	175.00	189.00		
22x33	54.00	59.00	68.00	74.00	210.00	227.00		
24x36	67.00	72.00	84.00	90.00	250.00	267.00		

Furnished faced only, unless otherwise ordered.

*Cast Steel Blind Flanges when ordered faced and drilled, will always be furnished with spot faced bolt holes at prices given above.

Special Eccentric Flanges, page 420.

For drilling templates, see page 598.

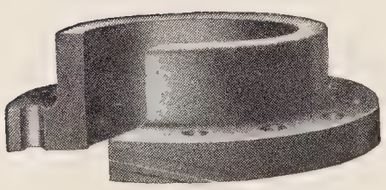
Spot facing bolt holes, list price 10 cents per hole.

EXTRA HEAVY

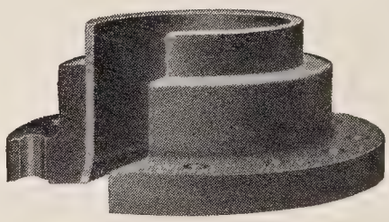
SHRINK COMPANION FLANGES

CAST IRON, FERROSTEEL, CAST STEEL AND FORGED STEEL

FOR STEAM WORKING PRESSURES UP TO 250 POUNDS



FACED AND DRILLED BUT NOT BORED



FACED AND DRILLED AND SHRUNK ON PIPE

CODE: MULINAVAMO

Size	No. 161 E Cast Iron		No. 261 E Ferrosteel		No. 283 D Cast Steel		No. 293 E Forged Steel	
	Faced and Drilled, but not Bored	Boring, Shrinking on Pipe & Refacing, not including Flange	Faced and Drilled but not Bored	Boring, Shrinking on Pipe & Refacing, not including Flange	*Faced, Drilled and Spot Faced, but not Bored	Boring, Shrinking on Pipe and Refacing, not Including Flange	Faced and Drilled but not Bored	Boring, Shrinking on Pipe and Refacing, not including Flange
Inches	Each	Each	Each	Each	Each	Each	Each	Each
4x10	8.00	11.00	10.00	11.00	20.00	11.00		
4½x10½	9.00	11.00	11.25	11.00	22.00	11.00		
5x11	10.00	11.00	12.50	11.00	24.00	11.00		
6x12½	11.00	11.00	13.75	11.00	28.00	11.00	27.00	11.00
7x14	13.00	13.00	16.25	13.00	33.00	13.00	32.00	13.00
8x15	15.00	14.00	18.75	14.00	38.00	14.00	37.00	14.00
9x16¼	17.00	15.00	21.25	15.00	43.00	15.00	42.00	15.00
10x17½	18.00	16.00	22.50	16.00	49.00	16.00	47.00	16.00
12x20½	24.00	16.00	30.00	16.00	59.00	16.00	65.00	16.00
14x23	29.00	16.00	36.00	16.00	75.00	16.00	80.00	16.00
15x24½	32.00	16.00	40.00	16.00	85.00	16.00	95.00	16.00
16x25½	36.00	17.00	45.00	17.00	95.00	17.00	105.00	17.00
18x28	42.00	19.00	52.50	19.00	116.00	19.00	125.00	19.00
20x30½	50.00	20.00	62.50	20.00	136.00	20.00	150.00	20.00
22x33	63.00	22.00	80.00	22.00	157.00	22.00		
24x36	75.00	25.00	95.00	25.00	182.00	25.00		

Sizes 14-inch and larger are to be used with O. D. Pipe of the same sizes.

*Cast Steel Flanges, when ordered faced and drilled, will always be furnished with bolt holes spot faced at the prices given above.

Extra prices for special facing, bolting on and for wooden protectors, page 490.

Shrink Flanges with Bosses for bolt holes, prices on application.

For general dimensions, see page 666.

For drilling templates, see page 598.

Spot Facing Bolt Holes, list price, 10 cents per hole.

FOR FURTHER DESCRIPTION AND ILLUSTRATIONS OF PIPE JOINTS, SEE PAGES 463 TO 469

EXTRA HEAVY

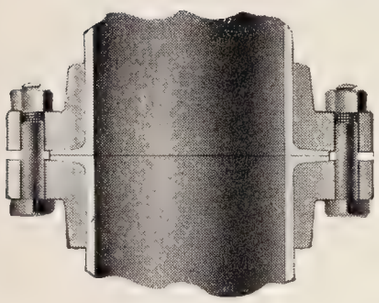
CRANELAP FLANGED PIPE JOINTS

WITH SWIVEL FLANGES PATENTED

CAST IRON, FERROSTEEL AND MALLEABLE IRON FOR SATURATED STEAM WORKING PRESSURES UP TO 250 POUNDS

FOR SUPERHEATED STEAM RATING OF FERROSTEEL SEE PAGE 435

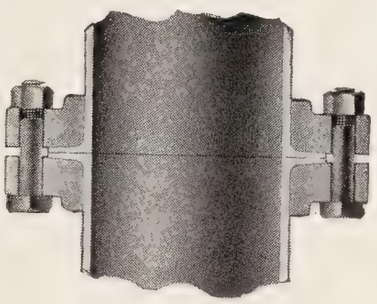
CAST STEEL AND FORGED STEEL FOR SUPERHEATED STEAM WORKING PRESSURES UP TO 350 POUNDS



LONG HUB

STEEL BOLTS OF HIGH TENSILE STRENGTH or commercial bolts larger in diameter must be used on flanges when they are subjected to steam working pressures in excess of 300 pounds.

A. S. M. E. EXTRA HEAVY BOLTING using commercial bolts is not strong enough for steam working pressures in excess of 300 pounds.



SHORT HUB

No. 181 E

CODE: MUMSCHANZ

Size	Faced and Drilled, Placed on Pipe and Refaced, Per Flange					
	Cast Iron Long Hub	Ferrosteel Long Hub	Malleable Iron Short Hub	*Cast Steel Short Hub Spot Faced	Forged Steel Short Hub	Forged Steel Long Hub
Inches	Each	Each	Each	Each	Each	Each
4x10	19.00	21.00	23.00	FURNISHED IN FORGED STEEL ONLY	31.00	31.00
4½x10½	20.00	22.25	24.50		33.00	33.00
5x11	21.00	23.50	26.00		35.00	35.00
6x12½	22.00	24.75	27.50		38.00	38.00
7x14	26.00	29.25	32.00		45.00	45.00
8x15	29.00	32.75	36.00		51.00	51.00
9x16¼	32.00	36.25	40.00		57.00	57.00
10x17½	34.00	38.50	43.00		63.00	63.00
12x20½	40.00	46.00	51.00		81.00	81.00
14x23	45.00	52.00	58.00	91.00	96.00	96.00
15x24½	48.00	56.00	62.00	101.00	111.00	111.00
16x25½	53.00	62.00	70.00	112.00	122.00	122.00
18x28	61.00	71.50		135.00	144.00	144.00
20x30½	70.00	82.50		156.00	170.00	170.00
22x33	85.00	102.00		179.00		
24x36	100.00	120.00		207.00		

We can furnish these joints made from any regular thickness of pipe; but, unless otherwise specified, 12-inch and smaller joints will be made from Standard Pipe, and the larger sizes from pipe which is ⅜-inch thick.

We are prepared to furnish the faces of these joints with a smooth, lathe finish ready for grinding to a ground joint.

When ordering Cranelap Joints, always state specifically Long or Short Hub and kind of metal that the flanges are to be made of.

*Cast Steel Flanges, when ordered faced and drilled, will always be spot faced at the prices given above.

Bolts for Cranelap Joints will be proportionately longer than for other style joints. Prices on application.

Sizes 14-inch and larger are to be used with O. D. Pipe.

Extra prices for wooden protectors, etc., page 490.

For general dimensions, see page 666. For drilling templates, see page 598.
For further description and illustrations of Pipe Joints, see pages 463 to 469.
For Cranelap Flanges for High Pressure Installations, see page 465.

EXTRA HEAVY

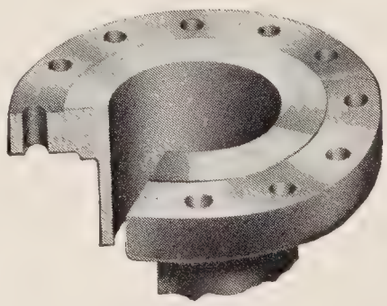
CRANEWELD FLANGED PIPE JOINTS

(FORGED STEEL FLANGE WELDED ON PIPE)

FOR SUPERHEATED STEAM WORKING PRESSURES UP TO 350 POUNDS AND A TOTAL TEMPERATURE OF 800 DEGREES FAHRENHEIT

STEEL BOLTS OF HIGH TENSILE STRENGTH or commercial bolts larger in diameter must be used on flanges when they are subjected to steam working pressures in excess of 300 pounds.

A. S. M. E. EXTRA HEAVY BOLTING using commercial bolts is not strong enough for steam working pressures in excess of 300 pounds.



No. 295 E
CODE: MUNDSPATEL

Size Inches	Welded, Refaced, but not Drilled Per End	Welded, Refaced, and Drilled Per End
3½x9	13.25	14.00
4x10	14.25	15.00
4½x10½	14.75	15.50
5x11	15.25	16.00
6x12½	16.25	17.00
7x14	19.75	20.50
8x15	22.25	23.00
9x16¼	25.25	26.00
10x17½	31.00	32.00
12x20½	40.00	41.00
14x23	49.75	51.00
15x24½	58.75	60.00
16x25½	63.75	65.00
18x28	67.50	69.00
20x30½	70.50	72.00
22x33	83.00	85.00
24x36	101.00	103.00

Sizes 14-inch and larger are for welding onto O. D. pipe of the same sizes.
Extra prices for Special Facing, Wooden Protectors, etc., page 490.
For general dimensions, see page 666.
Further description and illustrations of Pipe Joints, pages 463 to 469.
For Drilling Templates, see page 598.

PRICE LIST FOR DRILLING

STANDARD AND LOW PRESSURE

FLANGED VALVES

SIZE Inches	SIZE Millimeters	Drilling Valves with 2 Flanges except Angle Valves Each	Drilling Angle Valves Each	Drilling Cross Valves and Cross Safety Valves Each
¾	19	.60	1.00	1.20
1	25	.60	1.00	1.20
1¼	32	.60	1.00	1.20
1½	38	.60	1.00	1.20
2	50	.75	1.25	1.50
2½	64	.75	1.25	1.50
3	76	.75	1.25	1.50
3½	90	1.00	1.50	2.00
4	100	1.25	1.75	2.50
4½	113	1.50	2.00	3.00
5	125	1.50	2.00	3.00
6	150	1.75	2.50	3.50
7	175	2.25	3.00	4.50
8	200	2.25	3.00	4.50
9	225	2.50	3.50	5.00
10	250	2.50	3.50	5.00
12	300	3.50	5.00	7.00
14	350	4.00	6.00	
15	375	4.50	6.50	
16	400	5.00	7.00	
18	450	6.00	10.00	
20	500	7.50	12.00	
22	550	9.00	14.00	
24	600	10.00	16.00	
26	650	11.00	18.00	
28	700	12.00	20.00	
30	750	12.00	22.00	
32	800	12.00	22.00	
34	850	14.00	24.00	
36	900	14.00	24.00	
42	1050	25.00		
48	1200	30.00		

Bolt Holes will not be spot faced unless so ordered, when an extra charge will be made.

Spot facing bolt holes, list price ten cents per hole.

For drilling templates, see pages 596 and 597.

PRICE LIST FOR DRILLING

MEDIUM AND EXTRA HEAVY

BRASS, CAST IRON AND FERROSTEEL

FLANGED VALVES

Size Inches	Size Millimeters	Drilling Valves and Sediment Separators With 2 Flanges except Angle Valves Each	Drilling Angle Valves Each	Drilling Cross Valves and Twin Pop Valves 3 Flanges and Duplex Pop Valves Each	Drilling Pop Safety Valves Twin Pop Safety Valves and Relief Valves 1 Flange Each	Drilling Pop Safety Valves and Relief Valves 2 Flanges Each
¾	19	.60	1.00			
1	25	.60	1.00			
1¼	32	.60	1.00			
1½	38	.60	1.00	1.20	.60	1.00
2	50	.75	1.25	1.50	.75	1.25
2½	64	.75	1.25	1.50	.75	1.25
3	76	.75	1.25	1.50	.75	1.25
3½	90	1.00	1.50	2.00	1.00	1.50
4	100	1.25	1.75	2.50	1.25	1.75
4½	113	1.50	2.00	3.00	1.50	2.00
5	125	1.50	2.00	3.00	1.50	2.00
6	150	1.75	2.50	3.50	1.75	2.50
7	175	2.25	3.00	4.50		
8	200	2.25	3.00	4.50		
9	225	2.50	3.50	5.00		
10	250	2.50	3.50	5.00		
12	300	3.50	5.00	7.00		
14	350	4.00	6.00	8.00		
15	375	4.50	6.50	9.00		
16	400	5.00	7.00			
18	450	6.00				
20	500	7.50				
22	550	9.00				
24	600	10.00				
30	750	12.00				

For drilling 5½-inch Marine Pop Safety Valves, use 6-inch prices

Bolt holes will not be spot faced unless so ordered, when an extra charge will be made

Spot facing bolt holes, list price ten cents per hole.

For drilling templates, see page 598.

PRICE LIST FOR DRILLING

AND

SPOT FACING

EXTRA HEAVY—CAST STEEL

FLANGED VALVES

Size Inches	Size Millimeters	Globe or Gate Valve Each	Angle Valve Each	Cross Valves Valve Each
1¼	32	2.75	3.25	
1½	38	2.75	3.25	
2	50	3.00	3.50	5.25
2½	64	3.25	3.75	5.75
3	76	3.75	4.25	6.50
3½	90	4.00	4.50	7.00
4	100	4.50	5.00	7.75
4½	113	4.75	5.25	8.25
5	125	5.00	5.50	8.75
6	150	6.00	7.00	10.50
7	175	7.00	8.00	12.00
8	200	8.00	9.00	13.50
9	225	9.00	10.00	
10	250	10.00	11.00	
12	300	12.00	13.50	
14	350	14.00	16.00	
15	375	15.00	17.00	
16	400	16.00		
18	450	20.00		
20	500	25.00		
22	550	30.00		
24	600	33.00		

FOR DRILLING TEMPLATES, SEE PAGE 598

PRICE LIST FOR DRILLING

800 POUND AMERICAN HYDRAULIC STANDARD

FERROSTEEL FLANGED VALVES

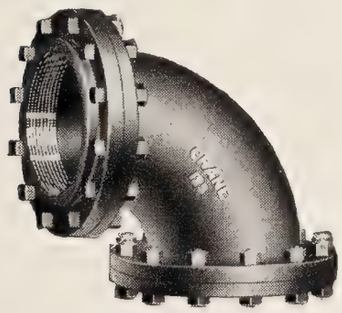
AND

BOLTING COMPANION FLANGES TO VALVES AND FITTINGS

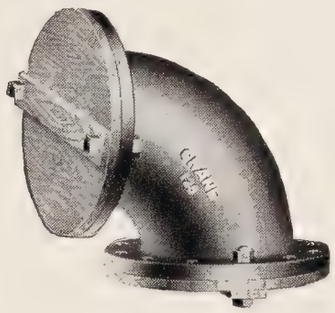
Size	Size	Drilling Valves with Two Flanges	Bolting on Companion Flanges, not Including Bolts or Gaskets; for Labor only		
Inches	Millimeters	Each	Extra for Valve or Fitting with 2 Flanges	Extra for Fitting with 3 Flanges	Extra for Fitting with 4 Flanges
1½	38	.80	1.10	1.65	2.20
2	50	1.00	1.10	1.65	2.20
2½	64	1.10	1.80	2.75	3.65
3	76	1.20	1.80	2.75	3.65
3½	90	1.25	1.80	2.75	3.65
4	100	1.30	1.80	2.75	3.65
4½	113	1.75	2.20	3.30	4.40
5	125	2.25	2.20	3.30	4.40
6	150	3.00	2.20	3.30	4.40
7	175	5.00	2.55	3.85	5.15
8	200	6.00	2.55	3.85	5.15
10	250	8.00	2.85	4.40	5.85
12	300	9.00	2.85	4.40	5.85

BOLT HOLES WILL NOT BE SPOT FACED UNLESS SO ORDERED.
SPOT FACING BOLT HOLES, LIST PRICE TEN CENTS PER HOLE.
FOR DRILLING TEMPLATES, SEE PAGE 599

EXTRA PRICES FOR ATTACHING COMPANION FLANGES TO STANDARD AND LOW PRESSURE CAST IRON FLANGED FITTINGS AND VALVES



SHOWING COMPANION FLANGES BOLTED ON



SHOWING WOODEN FLANGE PROTECTORS BOLTED ON

Size of Fitting or Valve Inches	Size of Fitting or Valve Millimeters	Bolting Companion Flanges to Fittings and Valves Not Including Bolts or Gaskets. For Labor Only.	Furnishing and Bolting on Wooden Protectors Including Two Bolts
		Price for Each Flange	Price for Each Flange
1¼	32	.35	.75
1½	38	.35	.75
2	50	.35	.75
2½	64	.35	.75
3	76	.35	.95
3½	90	.35	.95
4	100	.35	.95
4½	113	.55	.95
5	125	.55	.95
6	150	.55	.95
7	175	.55	1.15
8	200	.55	1.15
9	225	.75	1.15
10	250	.75	1.35
12	300	.75	1.35
14	350	.75	1.55
15	375	.95	1.55
16	400	.95	1.75
18	450	.95	1.75
20	500	.95	1.95
22	550	.95	1.95
24	600	.95	1.95

Sizes above 24-inch, prices on application.

The above prices apply to both Straight and Reducing Flanged Fittings, Flanges and Valves.

Gaskets will be furnished only when specified and at an extra price. See price list of Gaskets, pages 492 and 493.

For drilling templates, see page 596.

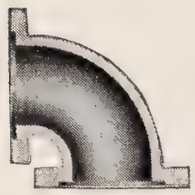
Price List for drilling, page 483.

EXTRA LIST PRICES FOR SPECIAL FACING, ETC.

EXTRA HEAVY

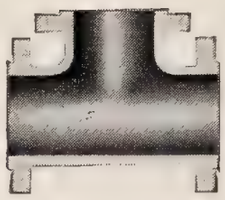
FLANGED VALVES AND FITTINGS

CAST IRON FERROSTEEL CAST STEEL

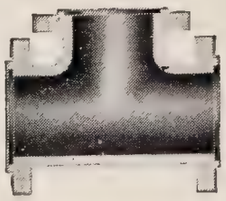


ELBOW WITH FEMALE FLANGES

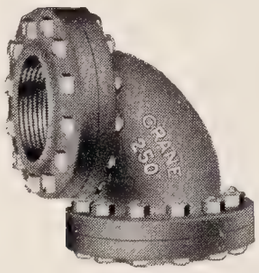
ELBOW WITH GROOVED FLANGES



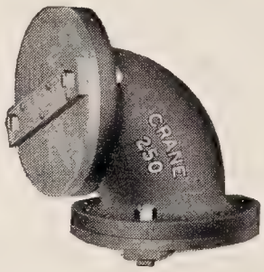
TEE WITH MALE FLANGES



TEE WITH TONGUED FLANGES



COMPANION FLANGES BOLTED ON



WOODEN FLANGE PROTECTOR BOLTED ON

Size Inches	Male or Female, Tongued or Grooved or Raised Face for Grinding			Bolting on Companion Flanges not Including Bolts or Gaskets For Labor Only			Furnishing and Bolting on Wooden Protectors, Including 2 Bolts		
	Extra for Fitting or Valve with Two Flanges	Extra for Fitting or Valve with Three Flanges	Extra for Fitting with Four Flanges	Extra for Fitting or Valve with Two Flanges	Extra for Fitting or Valve with Three Flanges	Extra for Fitting with Four Flanges	Extra for Fitting or Valve with Two Flanges	Extra for Fitting or Valve with Three Flanges	Extra for Fitting with Four Flanges
1¼ and 1½	3.60	4.50	6.25	.75	1.15	1.55	1.55	2.20	2.85
2	3.60	6.25	8.00	.75	1.15	1.55	1.55	2.20	2.85
2½	4.50	6.25	8.00	.75	1.15	1.55	1.55	2.20	2.85
3 to 5	4.50	6.25	8.00	1.15	1.65	2.20	1.95	2.75	3.65
6	5.40	7.15	9.00	1.55	2.20	2.85	1.95	2.75	3.65
7	5.40	7.15	9.00	1.55	2.20	2.85	2.20	3.25	4.30
8 and 9	7.15	9.00	10.85	1.55	2.20	2.85	2.20	3.25	4.30
10	7.15	9.00	10.85	1.55	2.20	2.85	2.50	3.75	5.00
12	9.00	10.85	12.50	1.95	2.75	3.65	2.50	3.75	5.00
14 and 15	11.65	14.35	18.00	1.95	2.75	3.65	2.85	4.30	5.75
16	14.35	18.00	21.75	1.95	2.75	3.65	3.25	4.85	6.45
18	18.00	22.35	26.85	1.95	2.75	3.65	3.25	4.85	6.45
20	21.75	26.85	32.25	1.95	2.75	3.65	3.65	5.40	7.15
22	28.75	35.75	35.75	1.95	2.75	3.65	3.65	5.40	7.15
24	35.75	44.75	44.75	1.95	2.75	3.65	3.65	5.40	7.15

The above list prices apply to both straight and reducing sizes.
To avoid mistakes in facing flanges, furnish drawing.
Gaskets will be furnished only when specified and at extra price.
Unless otherwise specified all flanges of Medium and Extra Heavy Valves and Fittings will be furnished with a raised face $\frac{1}{16}$-inch high for which no extra charge will be made.
For dimensions of facings, see page 665. For drilling templates, see page 598.
Price List for drilling, page 484.

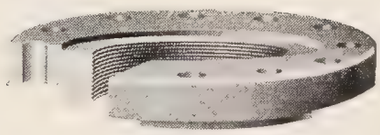
METHODS OF FACING

EXTRA HEAVY COMPANION FLANGES

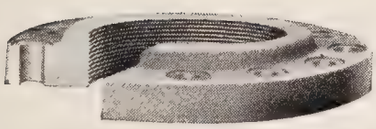
CAST IRON FERROSTEEL CAST STEEL FORGED STEEL

RAISED FACE

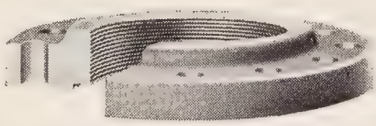
MALE FACE



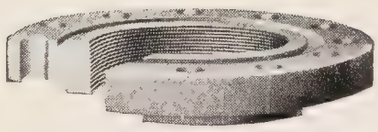
FEMALE FACE



SPOT FACED BOLT HOLES

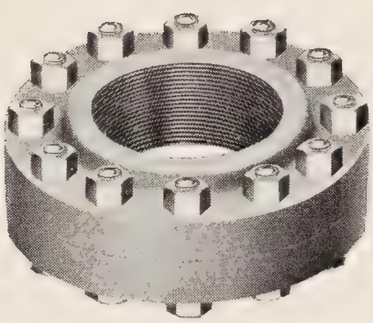


TONGUED FACE

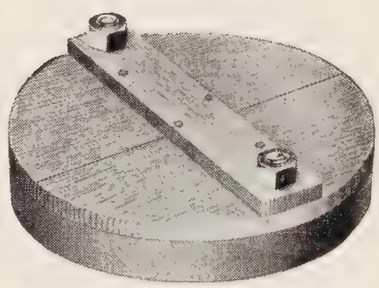


GROOVED FACE

CALKING RECESS



SHOWING COMPANION FLANGES BOLTED TOGETHER



SHOWING WOODEN FLANGE PROTECTOR BOLTED ON

NOTE.—Unless otherwise specified we will always furnish Extra Heavy Companion Flanges, with $\frac{1}{16}$-inch raised face, without extra charge.

Gaskets will be furnished only when specified and at an extra price. See price list for gaskets, pages 494 and 495.

To avoid mistakes in facing flanges, furnish drawings.

For dimensions of facings, see page 665.

For drilling templates, see page 598.

PRICE LIST FOR FACING

EXTRA HEAVY COMPANION FLANGES

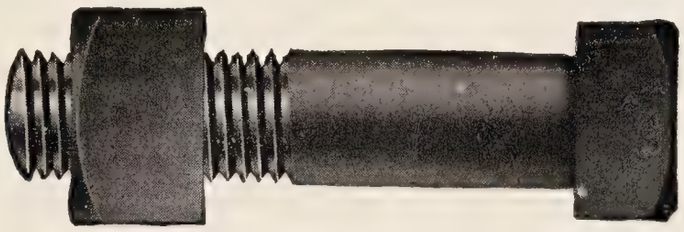
Size Inches	Extra for Male or Female Face Per Flange	Extra for Tongued or Grooved Face Per Flange	Extra for 1/16-Inch Raised Face for Grinding Per Flange	Extra for Calking Recess Per Flange	Extra for Wooden Protectors, Bolted on with 2 Small Bolts, including the 2 Bolts Per Flange
1x4½	1.75	1.75	1.75	1.75	.75
1¼x5	1.75	1.75	1.75	1.75	.75
1½x6	1.75	1.75	1.75	1.75	.75
2x6½	1.75	1.75	1.75	1.75	.75
2½x7½	2.35	2.35	2.35	2.35	.75
3x8¼	2.35	2.35	2.35	2.35	.95
3½x9	2.35	2.35	2.35	2.35	.95
4x10	2.35	2.35	2.35	2.35	.95
4½x10½	2.35	2.35	2.35	2.35	.95
5x11	2.35	2.35	2.35	2.35	.95
6x12½	2.85	2.85	2.85	2.85	.95
7x14	2.85	2.85	2.85	2.85	1.15
8x15	3.60	3.60	3.60	3.60	1.15
9x16¼	3.60	3.60	3.60	3.60	1.15
10x17½	3.60	3.60	3.60	3.60	1.35
12x20½	4.50	4.50	4.50	4.50	1.35
14x23	5.75	5.75	5.75	5.75	1.55
15x24½	5.75	5.75	5.75	5.75	1.55
16x25½	7.15	7.15	7.15	7.15	1.75
18x28	9.00	9.00	9.00	9.00	1.75
20x30½	10.85	10.85	10.85	10.85	1.95
22x33	14.35	14.35	14.35	14.35	1.95
24x36	18.00	18.00	18.00	18.00	1.95

The prices given above apply to both straight and reducing sizes.

MANUFACTURER'S STANDARD LIST OF

MACHINE BOLTS

WITH SQUARE HEADS AND SQUARE NUTS, FINISHED POINTS



CODE: MUNIFICABO

REVISED SEPTEMBER 1, 1923

PRICE PER 100

Diameter, In.	3/8	7/16	1/2	9/16 & 5/8	3/4	7/8	1	1 1/8	1 1/4
Length, In.									
1 1/2	2.40	3.00	3.70	5.50	7.70	10.50	15.10	22.50	30.00
2	2.60	3.25	4.00	5.90	8.25	11.20	16.00	23.70	31.50
2 1/2	2.80	3.50	4.30	6.30	8.80	11.90	16.90	24.90	33.00
3	3.00	3.75	4.60	6.70	9.35	12.60	17.80	26.10	34.50
3 1/2	3.20	4.00	4.90	7.10	9.90	13.30	18.70	27.30	36.00
4	3.40	4.25	5.20	7.50	10.45	14.00	19.60	28.50	37.50
4 1/2	3.60	4.50	5.50	7.90	11.00	14.70	20.50	29.70	39.00
5	3.80	4.75	5.80	8.30	11.55	15.40	21.40	30.90	40.50
5 1/2	4.00	5.00	6.10	8.70	12.10	16.10	22.30	32.10	42.00
6	4.20	5.25	6.40	9.10	12.65	16.80	23.20	33.30	43.50
6 1/2	5.40	6.50	7.70	9.50	13.20	17.50	24.10	34.50	45.00
7	5.60	6.75	8.00	9.90	13.75	18.20	25.00	35.70	46.50
7 1/2	5.80	7.00	8.30	10.30	14.30	18.90	25.90	36.90	48.00
8	6.00	7.25	8.60	10.70	14.85	19.60	26.80	38.10	49.50
9	6.40	7.75	9.20	11.50	15.95	21,00	28.60	40.50	52.50
10	6.80	8.25	9.80	12.30	17.05	22.40	30.40	42.90	55.50
11	7.20	8.75	10.40	13.10	18.15	23.80	32.20	45.30	58.50
12	7.60	9.25	11.00	13.90	19.25	25.20	34.00	47.70	61.50
13	8.00	9.75	11.60	14.70	20.35	26.60	35.80	50.10	64.50
14	8.40	10.25	12.20	15.50	21.45	28.00	37.60	52.50	67.50
15	8.80	10.75	12.80	16.30	22.55	29.40	39.40	54.90	70.50
16	9.20	11.25	13.40	17.10	23.65	30.80	41.20	57.30	73.50
17	9.60	11.75	14.00	17.90	24.75	32.20	43.00	59.70	76.50
18	10.00	12.25	14.60	18.70	25.85	33.60	44.80	62.10	79.50
19	10.40	12.75	15.20	19.50	26.95	35.00	46.60	64.50	82.50
20	10.80	13.25	15.80	20.30	28.05	36.40	48.40	66.90	85.50

Prices for bolts with special heads or nuts will be quoted on application.

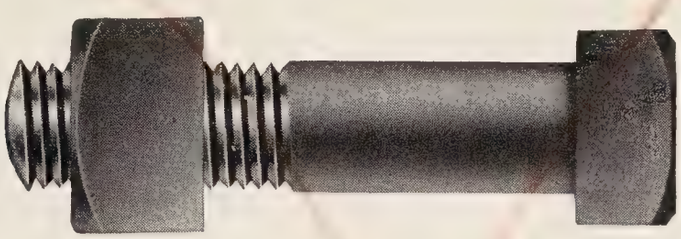
THE ABOVE PRICE LIST IS THE MANUFACTURERS STANDARD. IN THE PIPE AND FITTING INDUSTRY, SQUARE HEAD BOLTS WITH HEXAGON NUTS IS STANDARD PRACTICE, AND THEY WILL ALWAYS BE FURNISHED. ADD 10 PER CENT TO THE ABOVE LIST FOR HEXAGON NUTS.

FOR STRENGTH OF BOLTS, SEE PAGE 687.

MANUFACTURER'S STANDARD LIST OF

MACHINE BOLTS

WITH SQUARE HEADS AND SQUARE NUTS, FINISHED POINTS



CODE: MUNIFICABO

REVISED AUGUST 1, 1912

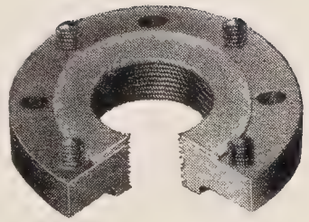
PRICE PER 100

Length Inches	3/8	7/16	1/2	9/16 & 5/8	3/4	7/8	1	1 1/8	1 1/4
3/4 to 1 1/2	2.40	2.80	3.60	5.20	7.70	10.50	15.10	22.50	30.00
2	2.56	3.00	3.86	5.58	8.25	11.20	16.00	23.70	31.50
2 1/2	2.72	3.20	4.12	5.96	8.80	11.90	16.90	24.90	33.00
3	2.88	3.40	4.38	6.34	9.35	12.60	17.80	26.10	34.50
3 1/2	3.04	3.60	4.64	6.72	9.90	13.30	18.70	27.30	36.00
4	3.20	3.80	4.90	7.10	10.45	14.00	19.60	28.50	37.50
4 1/2	3.36	4.00	5.16	7.48	11.00	14.70	20.50	29.70	39.00
5	3.52	4.20	5.42	7.86	11.55	15.40	21.40	30.90	40.50
5 1/2	3.68	4.40	5.68	8.24	12.10	16.10	22.30	32.10	42.00
6	3.84	4.60	5.94	8.62	12.65	16.80	23.20	33.30	43.50
6 1/2	4.00	4.80	6.20	9.00	13.20	17.50	24.10	34.50	45.00
7	4.16	5.00	6.46	9.38	13.75	18.20	25.00	35.70	46.50
7 1/2	4.32	5.20	6.72	9.76	14.30	18.90	25.90	36.90	48.00
8	4.48	5.40	6.98	10.14	14.85	19.60	26.80	38.10	49.50
9	4.80	5.80	7.50	10.90	15.95	21.00	28.60	40.50	52.50
10	5.12	6.20	8.02	11.66	17.05	22.40	30.40	42.90	55.50
11	5.44	6.60	8.54	12.42	18.15	23.80	32.20	45.30	58.50
12	5.76	7.00	9.06	13.18	19.25	25.20	34.00	47.70	61.50
13	6.08	7.40	9.58	13.94	20.35	26.60	35.80	50.10	64.50
14	6.40	7.80	10.10	14.70	21.45	28.00	37.60	52.50	67.50
15	6.72	8.20	10.62	15.46	22.55	29.40	39.40	54.90	70.50
16	7.04	8.60	11.14	16.22	23.65	30.80	41.20	57.30	73.50
17			11.66	16.98	24.75	32.20	43.00	59.70	76.50
18			12.18	17.74	25.85	33.60	44.80	62.10	79.50
19			12.70	18.50	26.95	35.00	46.60	64.50	82.50
20			13.22	19.26	28.05	36.40	48.40	66.90	85.50

Prices for bolts with special heads or nuts will be quoted on application.

THE ABOVE PRICE LIST IS THE MANUFACTURERS STANDARD. IN PIPE AND FITTING INDUSTRY, SQUARE HEAD BOLTS WITH HEXAGON NUTS IS STANDARD PRACTICE, AND THEY WILL ALWAYS BE FURNISHED. ADD 10 PER CENT TO THE ABOVE LIST FOR HEXAGON NUTS.

FOR STRENGTH OF BOLTS, SEE PAGE 687.



RUBBER
RING GASKETS

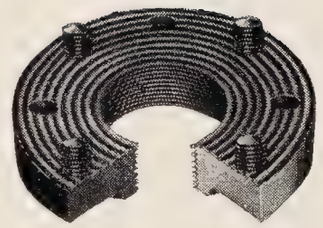
GASKETS

FOR STANDARD AND LOW PRESSURE

FLANGED VALVES AND FITTINGS

CODE: MUSARTIGEM

LIST PRICES AND DIMENSIONS



CORRUGATED COPPER
FULL FACE GASKET

RING GASKET							FULL FACE GASKET				
Size of Valve or Fitting	Size of Valve or Fitting	1/16-Inch Cloth Insertion Gaskets	1/16-Inch "CC" Gaskets	Corrugated Copper Gaskets	1/16-Inch Cranite Gaskets	Inside and Outside Diameters	1/16-Inch Cloth Insertion Gaskets	1/16-Inch "CC" Gaskets	Corrugated Copper Gaskets	1/16-Inch Cranite Gaskets	Inside and Outside Diameters
Inches	Millimeters	Each	Each	Each	Each	Inches	Each	Each	Each	Each	Inches
3/4	19	.05	.09	.15	.10	3/4x2 1/8	.10	.17	.18	.21	3/4x3 1/2
1	25	.05	.09	.16	.10	1x2 9/16	.10	.17	.25	.21	1x4
1 1/4	32	.07	.13	.17	.14	1 1/4x2 15/16	.14	.25	.30	.28	1 1/4x4 1/2
1 1/2	38	.07	.13	.18	.17	1 1/2x3 3/8	.14	.25	.35	.35	1 1/2x5
2	50	.07	.17	.21	.20	2x4 1/8	.18	.34	.50	.42	2x6
2 1/2	64	.09	.21	.27	.25	2 1/2x4 7/8	.23	.42	.67	.52	2 1/2x7
3	76	.12	.25	.31	.35	3x5 3/8	.28	.50	.75	.65	3x7 1/2
3 1/2	90	.14	.35	.47	.45	3 1/2x6 3/8	.30	.67	.95	.85	3 1/2x8 1/2
4	100	.16	.39	.52	.50	4x6 7/8	.35	.75	1.05	1.05	4x9
4 1/2	113	.16	.43	.52	.55	4 1/2x7	.37	.85	1.05	1.10	4 1/2x9 1/4
5	125	.19	.50	.55	.60	5x7 3/4	.42	1.00	1.20	1.20	5x10
6	150	.23	.59	.65	.70	6x8 3/4	.47	1.20	1.35	1.40	6x11
7	175	.28	.68	.80	.85	7x10	.58	1.35	1.70	1.75	7x12 1/2
8	200	.30	.75	.90	.95	8x11	.65	1.45	1.85	1.90	8x13 1/2
9	225	.37	.85	1.20	1.15	9x12 1/2	.81	1.70	2.25	2.25	9x15
10	250	.42	1.00	1.30	1.40	10x13 3/8	.88	2.00	2.45	2.75	10x16

CONTINUED ON NEXT PAGE

CONTINUED FROM OPPOSITE PAGE

12	300	.58	1.25	1.90	1.75	12x16⅛	1.15	2.50	3.40	3.45	12x19
14	350	.70	1.56	1.90	2.15	14x17¾	1.30	2.80	3.85	3.85	14x21
15	375	.75	1.77	2.15	2.55	15x19	1.50	3.25	4.25	4.75	15x22¼
16	400	.82	2.00	2.40	3.00	16x20¼	1.65	3.55	4.65	5.60	16x23½
18	450	.86	2.30	2.40	3.25	18x21⅝	1.85	4.00	4.75	6.00	18x25
20	500	1.02	2.50	2.75	3.60	20x23⅞	2.00	4.40	5.60	6.50	20x27½
22	550	1.10	2.60	3.05	4.30	22x26	2.10	4.60	6.10	7.75	22x29½
24	600	1.40	2.90	3.50	4.80	24x28¼	2.55	5.25		8.55	24x32
26	650	1.62	3.15		6.00	26x30½	3.25	7.30		12.00	26x34¼
28	700	1.85	4.15		6.85	28x32¾	3.45	7.85		13.75	28x36½
30	750	2.10	4.40		6.85	30x34⅝	3.80	8.90		13.75	30x38¾
32	800	2.30	5.75			32x37	4.15	11.45			32x41¾
34	850	2.65	6.25			34x39	4.65	12.50			34x43¾
36	900	2.90	6.80			36x41¼	5.10	13.55			36x46
38	950	3.10	7.30			38x43⅝		14.60			38x48¾
40	1000	3.35	7.80			40x45⅝		15.65			40x50¾
42	1050	3.50	8.05			42x47⅞		16.15			42x53
44	1100		8.35			44x50⅛		16.70			44x55¼
46	1150		8.85			46x52⅛		17.75			46x57¼
48	1200		9.40			48x54⅜		18.75			48x59½
50	1250		10.45			50x56½		20.85			50x61¾

Ring gaskets will always be furnished, unless otherwise ordered.

The commercial corrugated copper gasket is made from 27-gauge sheet copper, and this gauge will be furnished on all orders for low pressure or standard copper gaskets. We can furnish these gaskets made from heavier sheet copper at an extra price. We can furnish gaskets made from other commercial sheet packings or metals.

Full Face Gaskets are furnished without bolt holes; bolt holes will be punched at an extra price when so ordered.

GASKETS

FOR MEDIUM AND EXTRA HEAVY

FLANGED VALVES AND FITTINGS

CODE: MUSSAPFEL

LIST PRICES AND DIMENSIONS

Ring Gaskets						Full Face Gaskets			
Size of Valve or Fitting	Size of Valve or Fitting	"CC" Gaskets	Corrugated Copper Gaskets	1/16-Inch Cranite Gaskets	Inside and Outside Diameters	"CC" Gaskets	Corrugated Copper Gaskets	1/16-Inch Cranite Gaskets	Inside and Outside Diameter
Inches	Mm.	Each	Each	Each	Inches	Each	Each	Each	Inches
1	25	.17	.17	.14	1x2 3/4	.38	.30	.32	1x4 1/2
1 1/4	32	.17	.18	.17	1 1/4x3 1/4	.38	.36	.38	1 1/4x5
1 1/2	38	.17	.21	.21	1 1/2x3 7/8	.38	.54	.47	1 1/2x6
2	50	.19	.24	.26	2x4 3/8	.45	.60	.60	2x6 1/2
2 1/2	64	.25	.31	.33	2 1/2x5 1/8	.55	.80	.65	2 1/2x7 1/2
3	76	.32	.43	.41	3x5 7/8	.67	.95	.87	3x8 1/4
3 1/2	90	.35	.47	.46	3 1/2x6 1/2	.75	1.10	1.05	3 1/2x9
4	100	.38	.58	.57	4x7 1/8	.95	1.30	1.30	4x10
4 1/2	113	.44	.62	.61	4 1/2x7 3/4	1.00	1.40	1.40	4 1/2x10 1/2
5	125	.52	.75	.77	5x8 1/2	1.05	1.50	1.55	5x11
6	150	.63	1.00	.95	6x9 7/8	1.25	1.90	1.90	6x12 1/2
7	175	.85	1.15	1.20	7x11	1.55	2.30	2.30	7x14
8	200	.90	1.35	1.25	8x12 1/8	1.70	2.55	2.50	8x15
9	225	1.00	1.40	1.45	9x13	2.00	2.90	2.90	9x16 1/4
10	250	1.15	1.65	1.75	10x14 1/4	2.20	3.25	3.30	10x17 1/2
12	300	1.50	2.15	2.15	12x16 5/8	2.95	4.35	4.30	12x20 1/2
14	350	2.10	2.75	2.85	14x19 1/8	3.55	5.15	4.75	14x23
15	375	2.20	2.90	3.10	15x20 1/4	4.00	5.90	5.75	15x24 1/2
16	400	2.50	3.25	3.65	16x21 1/4	4.20	6.20	6.00	16x25 1/2
18	450	2.85	3.60	4.15	18x23 1/2	4.60	7.25	6.85	18x28
20	500	3.05	3.95	4.75	20x25 5/8	5.25		7.30	20x30 1/2
22	550	3.25	4.50	5.20	22x27 3/4	5.85		9.45	22x33
24	600	4.00		6.00	24x30 3/8	6.60		10.50	24x36

Ring Gaskets cover the faces of flanges inside of bolt holes, and will always be furnished unless otherwise ordered.

Corrugated Copper Gaskets are made from 27 gauge copper. We can, however, furnish these Gaskets made from a heavier gauge of copper, at an extra price, with either plain or corrugated faces, and hard or annealed. Special Corrugated Sheet Iron, or Steel Gaskets, for cyanide piping, made to order. We can furnish Gaskets, at special prices, made from other commercial sheet packings or metals.

Full Face Gaskets are furnished without bolt holes; bolt holes will be punched at an extra price when so ordered.

Note the superior claims of "Cranite" for high pressure and superheated steam as described on page 497.

GASKETS

FOR MEDIUM AND EXTRA HEAVY

FLANGED VALVES AND FITTINGS

CODE: MUTIGUNG

LIST PRICES AND DIMENSIONS

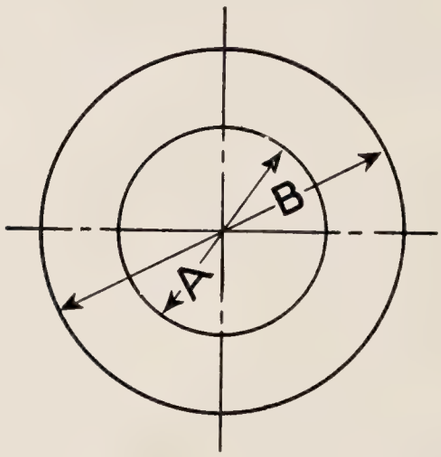
Gaskets for Male and Female Joints						Gaskets for Tongued and Grooved Joints			
Size of Valve or Fitting	Size of Valve or Fitting	"CC" Gaskets	Corrugated Copper Gaskets	1/16-Inch Cranite Gaskets	Inside and Outside Diameters	"CC" Gaskets	Corrugated Copper Gaskets	1/16-Inch Cranite Gaskets	Inside and Outside Diameters
Inches	Mm.	Each	Each	Each	Inches	Each	Each	Each	Inches
1	25	.11	.16	.09	1x2 5/16	.07	.17	.06	1 3/4 x2 1/2
1 1/4	32	.11	.17	.10	1 1/4 x2 3/4	.07	.18	.06	2 1/8 x3
1 1/2	38	.11	.18	.12	1 1/2 x3 1/8	.07	.19	.07	2 3/4 x3 5/8
2	50	.11	.19	.14	2x3 5/8	.07	.21	.09	3 1/8 x4 1/8
2 1/2	64	.13	.21	.17	2 1/2 x4 1/8	.09	.29	.12	3 5/8 x4 5/8
3	76	.17	.29	.22	3x5	.11	.29	.14	4 1/4 x5 1/4
3 1/2	90	.21	.32	.29	3 1/2 x5 1/2	.11	.35	.16	4 3/4 x5 3/4
4	100	.23	.38	.34	4x6	.13	.42	.17	5 1/4 x6 1/4
4 1/2	113	.28	.47	.36	4 1/2 x6 1/2	.13	.45	.17	5 3/4 x6 3/4
5	125	.32	.55	.46	5x7 1/4	.13	.55	.21	6 1/4 x7 1/4
6	150	.35	.65	.52	6x8 3/8	.15	.65	.23	7 1/2 x8 1/2
7	175	.42	.80	.60	7x9 3/8	.17	.80	.25	8 5/8 x9 5/8
8	200	.52	.90	.77	8x10 5/8	.23	.90	.30	9 5/8 x10 7/8
9	225	.57	1.20	.82	9x11 5/8	.25	1.20	.36	10 5/8 x11 7/8
10	250	.67	1.20	1.05	10x12 3/4	.32	1.20	.43	11 5/8 x13 1/8
12	300	.92	1.75	1.30	12x15 1/4	.38	1.75	.52	13 5/8 x15 1/8
14	350	1.00	1.90	1.40	14x16 1/2	.42	1.90	.60	15 7/8 x17 3/8
15	375	1.05	2.00	1.55	15x17 1/2	.46	2.15	.70	17 1/8 x18 5/8
16	400	1.20	2.15	1.80	16x18 1/2	.60	2.40	.85	18 3/8 x20 1/8
18	450	1.45	2.35	2.05	18x21	.75	2.75	1.20	20 3/8 x22 3/8
20	500	1.70	2.75	2.60	20x23	.85	2.90	1.40	22 5/16 x24 5/16
22	550	2.10	3.00	3.40	22x25 1/2	.95	3.40	1.55	24 1/2 x26 1/2
24	600	2.40	3.40	3.85	24x27 1/2	1.05	3.50	1.75	26 1/2 x28 1/2

Corrugated Copper Gaskets are made from 27 Gauge copper. We can, however, furnish these Gaskets made from a heavier gauge of copper, at an extra price, with either plain or corrugated faces, and hard or annealed. Special Corrugated Sheet Iron, or Steel Gaskets, for cyanide piping made to order. We can furnish Gaskets, at special prices, made from other commercial sheet packings or metals.

Note the superior claims of "Cranite" for high pressures and superheated steam as described on page 497.

RING GASKETS

FOR THE 800 POUND AMERICAN HYDRAULIC STANDARD



CODE: MUTTIVERAT

Size of Valve or Fitting	Size of Valve or Fitting	1/16-inch Cranite Gaskets		
		For 800 Pound Standard	Inside and Outside Dimensions	
Inches	Millimeters	Each	A	B
1/2	13		1/2	1 15/16
3/4	19		3/4	2 3/8
1	25		1	2 3/4
1 1/4	32		1 1/4	3 1/4
1 1/2	38	.21	1 1/2	3 7/8
2	50	.26	2	4 5/8
2 1/2	64	.33	2 1/2	5 1/8
3	76	.41	3	5 3/4
3 1/2	90	.52	3 1/2	6 5/8
4	100	.65	4	7 5/8
4 1/2	113	.85	4 1/2	8 3/8
5	125	1.05	5	9 1/2
6	150	1.20	6	10 1/2
7	175	1.40	7	11 1/2
8	200	1.55	8	12 5/8
9	225	2.25	9	14 3/8
10	250	2.50	10	15 3/4
12	300	3.10	12	18

CRANITE

ASBESTOS COMPOSITION SHEET PACKING

CODE: MUTUANTIUM

CRANITE IS THE HIGHEST GRADE OF SHEET PACKING OBTAINABLE

CRANITE is a packing for severe service, such as superheated steam, dry air, acids, oils, ammonia, alkali, gases, etc.

CRANITE gaskets are used on all CRANE valves for high pressure, saturated or superheated steam.

CRANITE is an asbestos packing, and only selected long fiber is used in its manufacture, giving it added strength.

As CRANITE does not deteriorate with age, it will be found economical to purchase it in quantities.

Regularly, the packing comes in sheets 1/16-inch thick, size 36 x 36 inches, also 48x48 inches.

If sufficient time is allowed this packing will be made to order in any thickness from 1/32 to 1/8-inch.

PRICES IN SHEETS

1/16-inch and thicker	1.90 per lb.
Less than 1/16-inch	2.35 per lb.

The 1/16-inch sheets weigh a little over a half pound to the square foot.

FOR PRICES AND DIMENSION TABLES OF CRANITE GASKETS, SEE PAGES 492 TO 496.

BRAIDED

PALMETTO PACKING

(SELF-LUBRICATING)

CODE: MUTUATICOS

TWIST

This packing is especially designed to meet the exacting conditions of steam, super steam, air and ammonia. It is made of a material that cannot char or burn and owing to our peculiar method of lubrication it does not get hard in service. Boxes contain about 5 lbs. each.

BRAIDED, ROUND OR SQUARE

Sizes, ¼ to 2 inches	Price per pound	1.00

PALMETTO TWIST

Sizes — Inches	⅛	3/16	¼
Number Feet to 1 Pound	90	65	30
Price per Pound	1.00	1.00	1.00

On 1 pound spools in individual boxes.

P. P. P. PISTON PACKING

Per pound	1.25

CC STERLING PACKING

CC Sterling, Sectional Ring	Per pound	2.00
CC Sterling, Spiral	Per pound	1.30

SQUARE FLAX PACKING

Per pound	.85

Sizes, ¼-inch to 1-inch.

PURE RUBBER VALVES

Per pound	1.50

SQUARE DUCK PISTON PACKING

Per pound	1.25

Made of Cotton Fabric, from ¼ to 1½-inch square, and lengths of 12 feet.

PLUMBERS' SPUN OAKUM

At market prices.

JUTE ROPE PACKING

Tarred and Untarred
At market prices

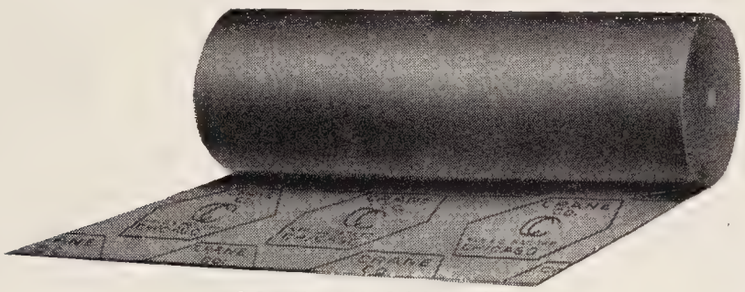
WASTE AND CANDLE WICKING

Waste (White and colored)	Per pound	At market prices
Candle Wicking	Per pound	At market prices

Gaskets for Standard and Low Pressure Goods, pages 492 and 493.
Gaskets for Extra Heavy Goods, pages 494 and 495.

C. C. SHEET PACKING

MANUFACTURED SOLELY FOR CRANE CO.



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C. C. PACKING IS THE RESULT OF YEARS OF EFFORT AND IS MADE TO A SPECIAL FORMULA. TO MAINTAIN ITS HIGH QUALITY IT IS GIVEN FREQUENT CAREFUL TESTS.

Adapted for all pressures of saturated steam, hot and cold water, air, gases, etc. Made in rolls 36 inches wide, containing about 200 pounds and in any thickness from $\frac{1}{32}$ to $\frac{1}{2}$-inch.

PRICE PER POUND $1.00

See pages 492 to 495 for prices of Gaskets for Crane Valves and Fittings. Gaskets of all sizes and shapes made to order at a special price.

C. C. SHEET PACKING

WITH WIRE INSERTION

MADE IN ROLLS 36 INCHES WIDE, ANY THICKNESS $\frac{1}{32}$ TO ¼-INCH

PRICE PER POUND $1.50

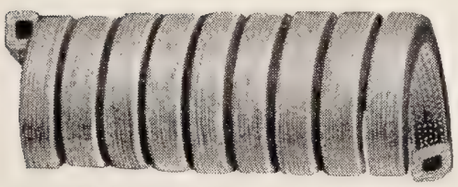
C. C. SPIRAL CORE

PISTON AND VALVE ROD PACKING

SQUARE AND ROUND

PRICE PER POUND $1.00

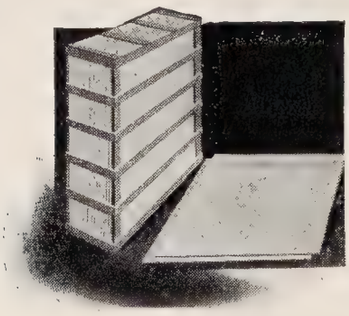
FURNISHED IN RINGS AT A SPECIAL PRICE



Diameter Inches	Contents of Box Feet	App. Weight of Box Pounds	Diameter Inches	Contents of Box Feet	App. Weight of Box Pounds
1/4	84	3 1/4	1	24	10
5/16	72	3 1/2	1 1/16	12	5 1/2
3/8	72	4 1/2	1 1/8	12	5 3/4
7/16	60	4 3/4	1 3/16	12	6 1/4
1/2	36	4	1 1/4	12	7 1/2
9/16	36	5 1/4	1 5/16	12	8 1/2
5/8	36	7 1/4	1 3/8	12	9
11/16	24	5 1/2	1 7/16	12	9 3/4
3/4	24	6	1 1/2	12	11
13/16	24	7 1/2	1 5/8	12	13 1/2
7/8	24	8 1/2	1 3/4	12	15 1/2
15/16	24	9 1/2	2	12	18 1/2

DIRECTIONS FOR USING, FURNISHED WITH PACKINGS

ASBESTOS SHEET MILLBOARD



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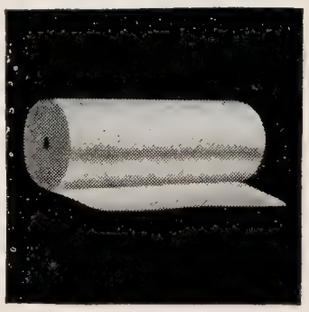
ASBESTOS PAPER



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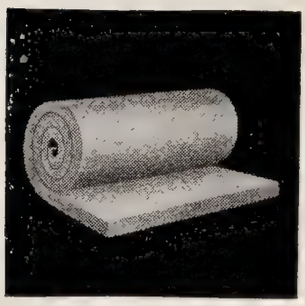
HAIR FELT



CODE: MYOPHONI

ASBESTOS SHEET MILLBOARD

STANDARD SHEETS 40x40 OR 42x44 INCHES

For general use where sheet or board is desired for protection against fire, heat, acid fumes, etc. Made of asbestos fibre and suitable binders.

Approx. Thickness.....Inches	1/32	3/64	1/16	3/32	1/8	3/16	1/4	3/8	1/2
Approx. Weight, per sheet.Pounds	2	3	4	6	8	12	16	24	32
Price, All Sizes.....Per Pound .30									

ASBESTOS PAPER

Approx. Thickness.....Inches	.015	.018	.02	.025	.028	1/32	1/16
Approx. Weight, 100 sq. ft.....Pounds	6	8	10	12	14	16	38
Price, All Sizes.....Per Pound .25							

HAIR FELT

Put up in bales 6 feet wide containing 300 square feet.

Hair Felt is used extensively for the protection of cold water pipes against freezing; for lining refrigerators, etc. It is also used, in connection with insulation for hot water pipes.

Thickness.....Inches	1/4	1/2	3/4	1	1 1/2	2
Price Per Square foot.....	.05 1/2	.06 1/2	.08 1/2	.10	.15	.19

ASBESTOS CEMENT

Asbestos Cement, 100 pound bag.....Per Bag		2.50
Asbestos Cement Felting, 100-pound bag.....Per Bag		5.00
Asbestos Hot-Blast Cement Felting, 100-pound bag.....Per Bag		7.00
85% Carbonate of Magnesia Cement, 60-pound bag.....Per Bag		7.50

A bag of cement will cover surfaces as follows:

Asbestos Cement 20 to 25 square feet, 1-inch thick.

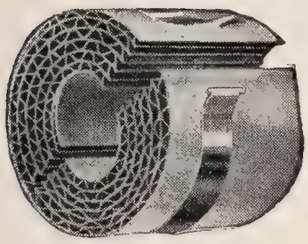
Asbestos Cement Felting, 25 to 30 square feet, 1-inch thick.

Asbestos Sponge Cement Felting, 40 square feet, 1-inch thick.

Asbestos Hot-blast Cement Felting is applied according to the degree of heat.

85% Carbonate of Magnesia Cement, 35 square feet, 1-inch thick.

SECTIONAL PIPE COVERINGS



CODE: MYOSOTARUM

AIR CELL

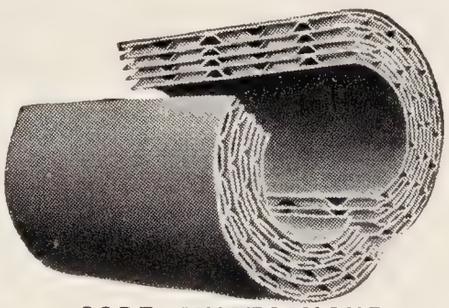
FOR MEDIUM STEAM PRESSURE AND HEATING PIPES

A light cellular covering constructed of corrugated asbestos paper, with channels running lengthwise of the pipe. A well known covering for medium and low pressure and hot water pipes. Made in thicknesses of ½ to 3 inches, to fit all standard sizes of pipe. Carried in stock regularly ¾ and 1-inch thick for all standard sizes of pipe.

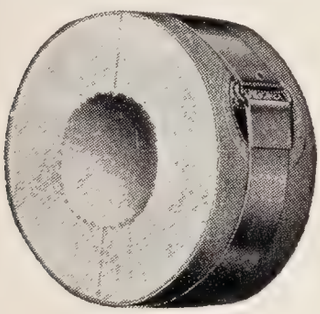
IMPROVED ASBESTOCEL

FOR STEAM, HOT WATER, OR HOT AIR PIPES

The unique cellular construction of Improved Asbestocel effectively prevents circulation of air through the covering, and therefore saves more fuel and heat than Air Cell. Improved Asbestocel is strong, durable, economical, neat in appearance, and saves more heat per dollar of cost than any other household insulation on the market. Made in thicknesses from ½-inch to 1 ½ inches inclusive, to fit standard sizes of pipes.



CODE: MYOTOMIQUE



CODE: MYRMECOBE

85 PER CENT MAGNESIA

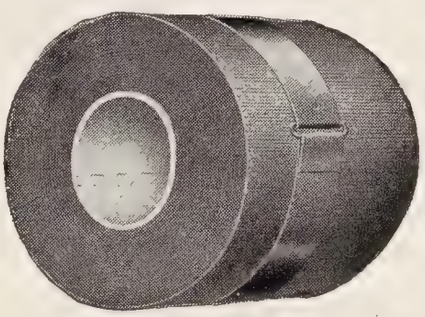
FOR HIGH PRESSURE AND SUPERHEATED STEAM PIPES

This well-known form of high pressure pipe covering combines the high non-conducting qualities of carbonate of magnesia and asbestos in a light, highly efficient insulation. It is recommended for high pressure and super-heated steam surfaces. This covering is furnished in various thicknesses from 1 to 3 inches, sectional form, to fit standard pipes, ½ to 14 inches; for larger pipes, curved segments or blocks are supplied. Carried in stock 1-inch thick.

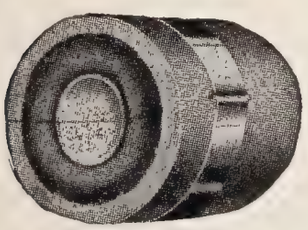
WOOL FELT

FOR LOW PRESSURE STEAM AND HOT WATER HEATING SYSTEMS

Made in sections 3 feet long and manufactured in three styles: Standard—Corrugated laminations of wool felt 1-inch thick, with an interlining of two layers of asbestos paper. Champion or Express — Corrugated laminations of wool felt ¾-inch thick with one layer of asbestos paper. Aqua or C. B.—Corrugated laminations of wool felt ½-inch thick with one layer of asbestos paper. ½-inch will be shipped, unless otherwise ordered.



CODE: MYROBOLANO



CODE: MYROSPERME

ZERO

TO PROTECT PIPES FROM FREEZING

A combination of hair and wool insulating felts specially designed for protection of cold water pipes from freezing. Where protection is required against low temperatures on pipes outdoors or exposed to the weather, we recommend two layers of Zero Covering, applied so as to break joints and furnished with Weatherproof Asbestos Roofing Jacket. Furnished approximately 1 ¼ inches thick only, for all standard sizes of pipe.

Inside Diam. of Pipe ..... Inches	½	¾	1	1 ¼	1 ½	2	2 ½	3	3 ½
Covering ..... Per foot	.22	.24	.27	.30	.33	.36	.40	.45	.50
Elbow Covers ..... Each	.30	.30	.30	.30	.30	.36	.42	.48	.54
Tee Covers ..... Each	.36	.36	.36	.36	.36	.42	.48	.54	.60
Cross Covers ..... Each	.48	.48	.48	.48	.48	.54	.60	.70	.80
Globe Valve Covers ..... Each	.54	.54	.54	.54	.54	.60	.78	.96	1.20
Flange Covers ..... Each	.50	.50	.50	.50	.50	.60	.70	.80	.90

Inside Diam. of Pipe ..... Inches	4	4 ½	5	6	7	8	9	10	12
Covering ..... Per foot	.60	.65	.70	.80	1.00	1.10	1.20	1.30	1.85
Elbow Covers ..... Each	.60	.72	.90	1.30	1.80	2.40	3.00	3.60	....
Tee Covers ..... Each	.75	.90	1.20	1.60	2.20	3.00	3.80	4.60	....
Cross Covers ..... Each	.95	1.10	1.50	2.00	2.80	3.60	4.40	5.20	....
Globe Valve Covers ..... Each	1.50	1.85	2.25	2.80	3.60	4.40	5.30	6.20	....
Flange Covers ..... Each	1.00	1.30	1.60	1.90	2.20	2.50	2.90	3.30	....

VALVES FOR AMMONIA, AIR, OIL, GAS, CHEMICALS, ETC.

WHERE ALL-IRON CONSTRUCTION IS DESIRABLE

DESIGN

The Iron and Steel Valves and Fittings illustrated on the following pages were designed for High Pressure Ammonia Service, in accordance with approved engineering practice as to standard, interchangeability of parts, proportions, thickness of metals, etc.

APPLICATION

Since this line of material was placed on the market, it has also been found satisfactory for use where heavy all-iron construction has been necessary. The following gives some of the services where this material has been found usable:

High Pressure Air	Chlorine
Hydrogen	Caustic Soda
Nitrogen	Alkalies
Helium	Benzol
Casing Head Gasoline Plants	Tuloul
Concentrated Sulphuric Acid	Cyanide
Wood Alcohol	Creosote
Vegetable Oil Refineries	Gas Plants

Other services of like nature

FLANGES

The bolt holes in flanges, flanged valves and flanged fittings, 1-inch and larger, are drilled in multiples of four, so that fittings, except the oval, may be made to face in any quarter; bolt holes straddle center line, and on all sizes, bolt circles and the numbers and sizes of bolts are the American Standard for Extra Heavy Pressures.

INTERCHANGEABILITY OF VALVES, ELBOWS, TEES AND CROSSES

Flanged Valves, Elbows, Tees and Crosses of the same type and size have the same center to end dimensions. For example a tongue and groove globe valve may be substituted for a tongue and groove tee or cross; a tongue and groove angle valve for a tongue and groove elbow, etc. See dimension tables, pages 669 to 676.

VALVE CONSTRUCTION

Valves have special metal disc rings, plated steel stems with Acme threads and deep stuffing boxes, which are always packed before shipment.

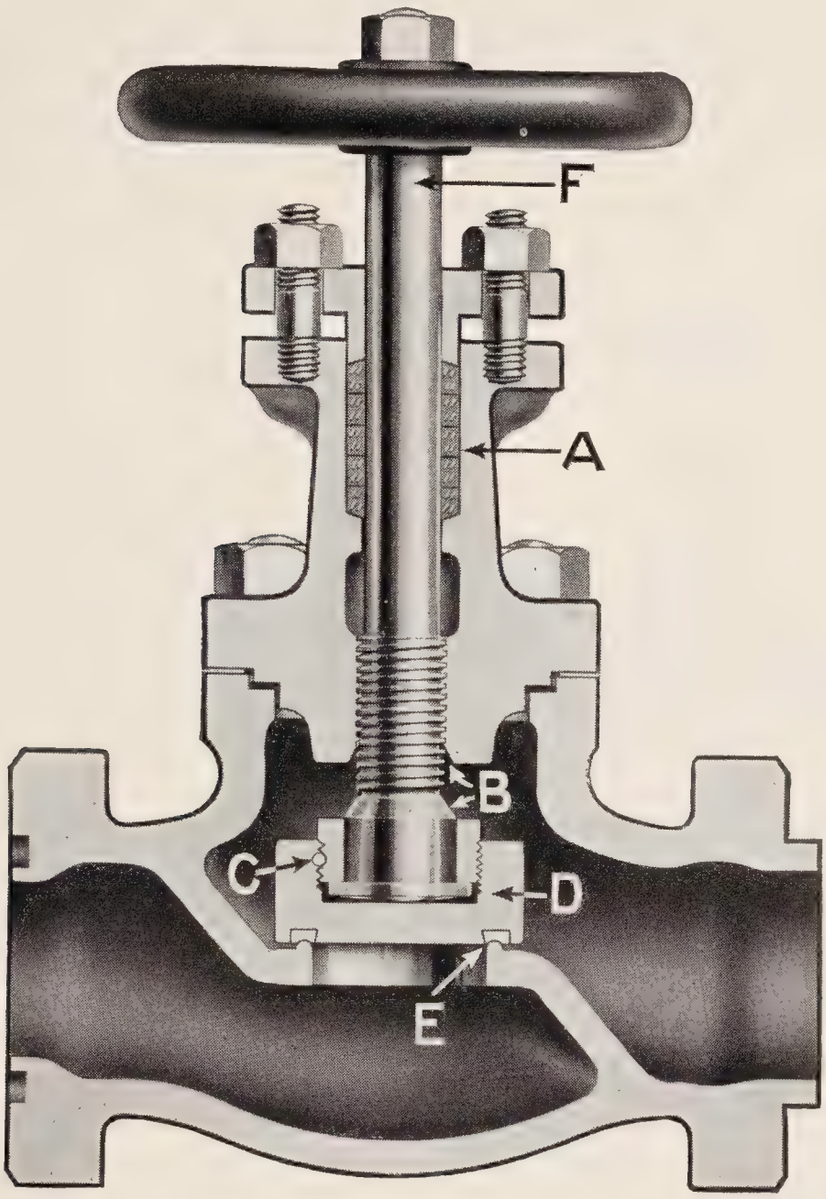
These valves when wide open may be repacked while under pressure.

WORKING PRESSURE AND TESTS GIVEN

These valves and fittings are suitable for working pressures for which they are marked, and are subjected to an air-under-water test of 300 pounds. We have at times subjected different sizes of valves to 4,000 pounds without breaking.

METALS

All flanged valves and flanged fittings are made of ferrosteel. All screwed fittings are made of malleable iron. Flanges are made of ferrosteel, malleable iron or forged steel, depending upon the style and size of flange. We can supply this line made in forged steel or cast steel as service requirements demand.



No. 1501

POINTS OF SUPERIORITY

(A) Deep stuffing box, holding five rings of packing.

(B) When the valve is opened wide the taper collar on the stem makes a pressure tight joint in the bonnet.

(C) Disc nut is pinned firmly and cannot work loose.

(D) A heavy substantial disc nut having a long thread.

(E) Special metal disc ring rolled in and faced, the disc ring and disc holder practically forming a homogeneous piece of metal.

(F) All stems are of cold rolled steel and plated.

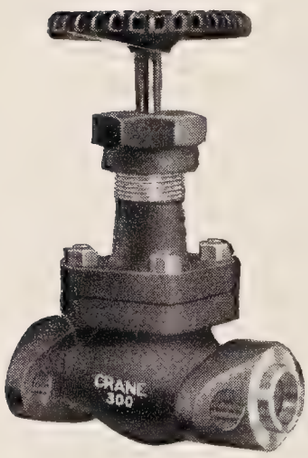
ALL-IRON VALVES

GLOBE AND ANGLE

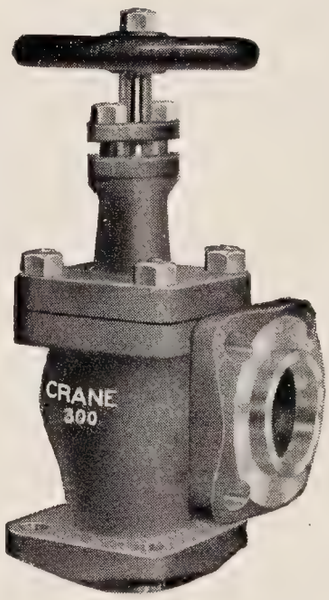
(FERROSTEEL WITH SPECIAL METAL DISCS)

FOR AMMONIA, AIR, GAS, CHEMICALS AND OTHER SERVICES WHERE ALL-IRON CONSTRUCTION IS DESIRABLE

FOR WORKING PRESSURES UP TO 300 POUNDS
TONGUE AND GROOVE ENDS



No. 1501
CODE: MYTHENHAFT



No. 1503
CODE: NABABBELDE

Style of Flanges	Oval				Square				
Size, Inches	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2
Size, Millimeters	6	10	13	19	25	32	38	50	64
No. 1501, Globe or No. 1503 Angle without Companion Flanges, Bolts and Gaskets, Each	6.00	6.50	7.00	8.00	9.00	15.00	16.00	19.00	28.50
No. 1501 Globe or No. 1503 Angle with Companion Flanges, Bolts and Gaskets, Each	7.50	8.00	8.50	9.50	11.00	18.00	19.00	23.00	34.00

Style of Flanges	Round								
Size, Inches	3	3 1/2	4	5	6	7	8	10	12
Size, Millimeters	76	90	100	125	150	175	200	250	300
No. 1501 Globe or No. 1503 Angle without Companion Flanges, Bolts and Gaskets, Each	43.20	55.80	72.00	103.20	138.00	168.00	228.00	288.00	420.00
No. 1501 Globe or No. 1503 Angle with Companion Flanges, Bolts and Gaskets, Each	53.40	67.80	86.40	121.20	162.00	198.00	264.00	336.00	480.00

Valves, sizes 7, 8, 10 and 12-inch are made with outside thread and yoke.

We will always furnish Valves with Companion Flanges, Gaskets and Bolts, unless otherwise specified.

For dimensions, see pages 669 to 671.

For drilling templates and tongue and groove dimensions, see page 674.

For description of these Valves, see pages 502 and 503.

ALL-IRON VALVES

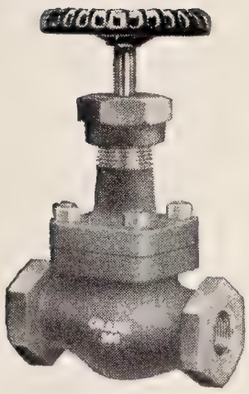
GLOBE AND ANGLE

(FERROSTEEL WITH SPECIAL METAL DISCS)

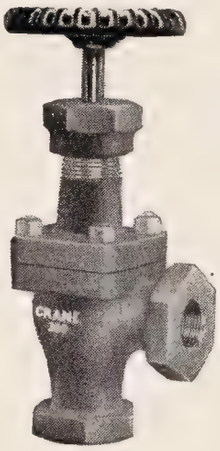
FOR AMMONIA, AIR, GAS, CHEMICALS AND OTHER SERVICES WHERE ALL-IRON CONSTRUCTION IS DESIRABLE

FOR WORKING PRESSURES UP TO 300 POUNDS

SCREWED ENDS



No. 1504
CODE: NABELFAULE



No. 1505
CODE: NABELVENE

Size	Inches	1/4	3/8	1/2	3/4	1
Size	Millimeters	6	10	13	19	25
No. 1504, Globe, or No. 1505, Angle	Each	3.50	4.50	5.00	5.50	6.00
Size	Inches	1 1/4	1 1/2	2	2 1/2	3
Size	Millimeters	32	38	50	64	76
No. 1504, Globe, or No. 1505, Angle	Each	7.50	9.00	12.00	16.00	21.00

With the exception of the end connections, these Valves are the same construction as the tongue and groove end Valves.

For dimensions, see pages 669 and 670.
For description of these Valves, see pages 502 and 503.

ALL-IRON

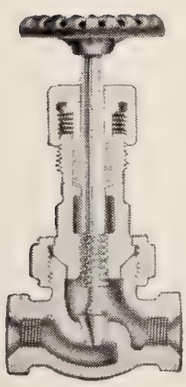
REGRINDING GLOBE AND ANGLE VALVES

FOR AMMONIA, AIR, GAS, CHEMICALS AND OTHER SERVICES WHERE ALL-IRON CONSTRUCTION IS DESIRABLE

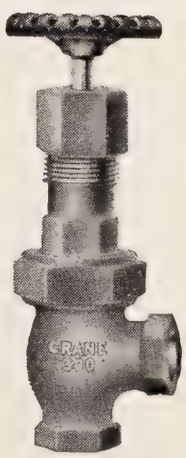
FERROSTEEL COLD ROLLED STEEL STEMS

MALLEABLE IRON UNION RING

SCREWED ENDS



No. 1504 1/2
CODE: NABETALEN



No. 1505 1/2
CODE: NABIJKOMEN

Size	Inches	1/4	3/8	1/2	3/4	1
Size	Millimeters	6	10	13	19	25
Price, Globe or Angle	Each	3.00	3.60	4.00	4.40	5.00
Center to End, Angle	Inches	1 1/2	1 5/8	1 3/4	2	2 1/4
End to End, Globe	Inches	3	3 1/4	3 1/2	4	4 1/2

These Valves have a long, tapering, plug seat, which may be reground.

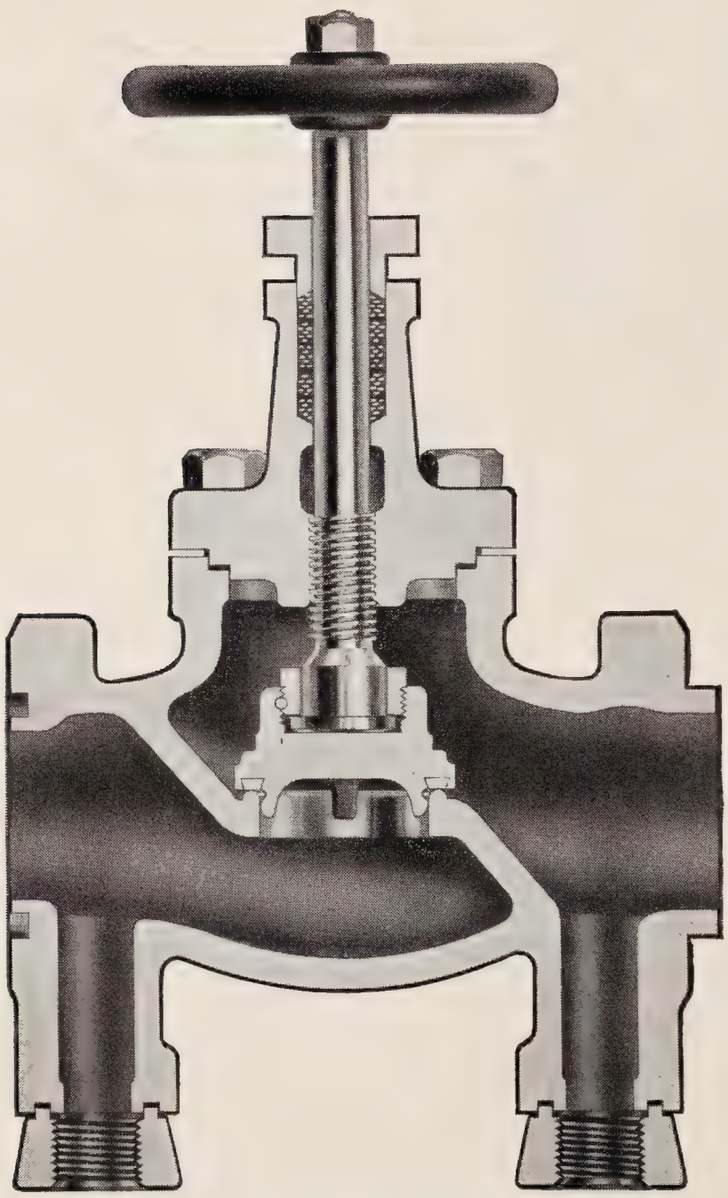
ALL-IRON VALVES

GLOBE AND ANGLE WITH BY-PASS CONNECTIONS

FOR AMMONIA, AIR, GAS, CHEMICALS AND OTHER SERVICES WHERE ALL IRON CONSTRUCTION IS DESIRABLE

FOR WORKING PRESSURES UP TO 300 POUNDS

TONGUE AND GROOVE ENDS



No. 1501½ GLOBE
CODE: NABISSANTE

No. 1503½ ANGLE
CODE: NABISSAVA

These valves are used on the suction and discharge ends of Ammonia Compressors. The purpose of the by-pass is to allow for pumping out the condensers and discharging into the expansion coils, etc.

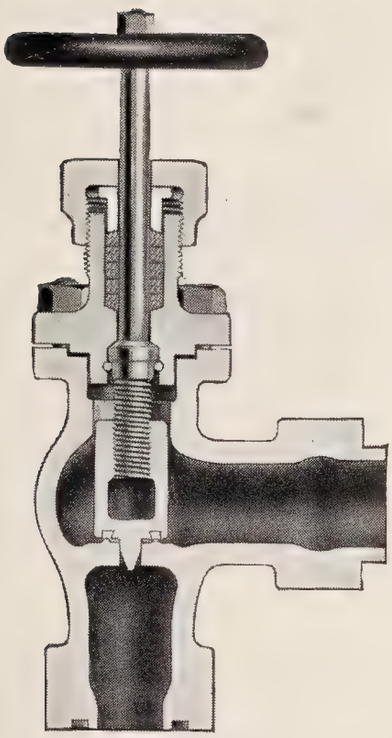
Sizes 1-inch and larger have flanged by-pass connections.

PRICES ON APPLICATION

ALL-IRON

EXPANSION VALVES

FOR AMMONIA OR OTHER SERVICES REQUIRING NEEDLE POINT CONSTRUCTION



No. 1515
NON-RISING STEM
FERROSTEEL

We furnish two styles of expansion valves, one of the needle type with non-rising stem and soft-metal seat ring, and the other of the plain needle type with rising stem.

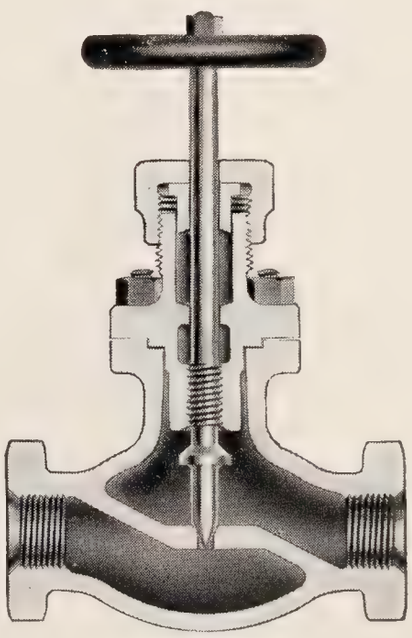
The non-rising stem valve does away with wire drawing, the special metal ring clearing the seat before expansion starts. These valves when wide open may be repacked while under pressure.

Rising Stem Expansion Valves will be found more satisfactory for short lines, while the non-rising stem type is recommended for long lines.

The stems of both styles are made of cold rolled steel and have fine threads which permit of close adjustment.

All sizes of both styles of Expansion Valves are furnished with either tongue and groove ends or screwed ends.

The wheels on these Valves are marked "Expansion Valve."



No. 1519½
RISING STEM
FERROSTEEL

WE ARE ALSO PREPARED TO FURNISH SMALL FORGED STEEL GLOBE AND ANGLE TYPE NEEDLE POINT EXPANSION VALVES. PRICES ON APPLICATION

ALL-IRON

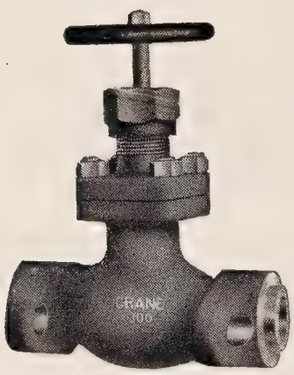
EXPANSION VALVES

NON-RISING STEM

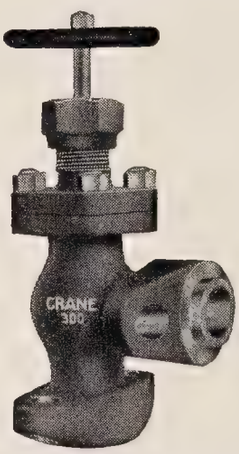
(FERROSTEEL WITH SPECIAL METAL NEEDLE POINT DISCS)

FOR AMMONIA, AIR, GAS, CHEMICALS AND OTHER SERVICES WHERE ALL-IRON CONSTRUCTION IS DESIRABLE

FOR WORKING PRESSURES UP TO 300 POUNDS



No. 1511
CODE: NABISSIAMO

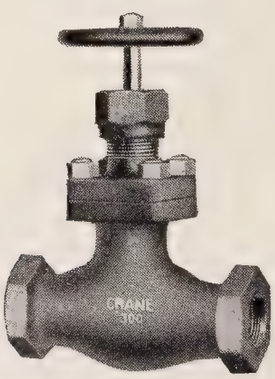


No. 1515
CODE: NABLIZARAT

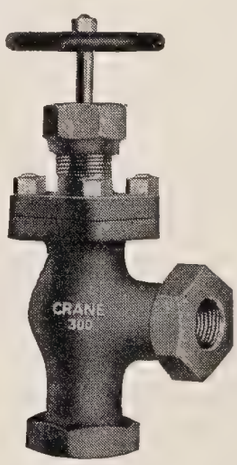
TONGUE AND GROOVE ENDS

Size.....Inches	1/4	3/8	1/2	3/4	1
Size.....Millimeters	6	10	13	19	25
No. 1511 Globe or No. 1515 Angle, without Companion Flanges, Bolts and Gaskets..Each	6.00	6.50	7.00	8.00	9.00
No. 1511 Globe or No. 1515 Angle, with Companion Flanges, Bolts and Gaskets.....Each	7.50	8.00	8.50	9.50	11.00

We will always furnish Flanged Valves complete with Companion Flanges, Gaskets and Bolts, unless otherwise specified.



No. 1519
CODE: NABORDUREN



No. 1519¼
CODE: NABRANDEN

SCREWED ENDS

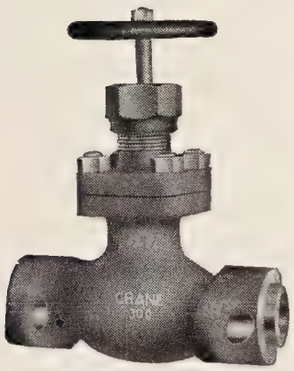
Size.....Inches	1/4	3/8	1/2	3/4	1
Size.....Millimeters	6	10	13	19	25
No. 1519 Globe or No. 1519¼ Angle.....Each	4.75	5.50	6.00	6.80	7.50
Center to End.....Inches	2 1/4	2 3/8	2 1/2	2 3/4	3 1/8

For dimensions, see pages 669 and 670.
For drilling templates and tongue and groove dimensions, see page 674.
For description, see pages 502 and 503.

ALL-IRON
EXPANSION VALVES
RISING STEM
(FERROSTEEL)
WITH NEEDLE POINT DISCS

FOR AMMONIA, AIR, GAS, CHEMICALS AND OTHER SERVICES WHERE ALL-IRON CONSTRUCTION IS DESIRABLE

FOR WORKING PRESSURES UP TO 300 POUNDS



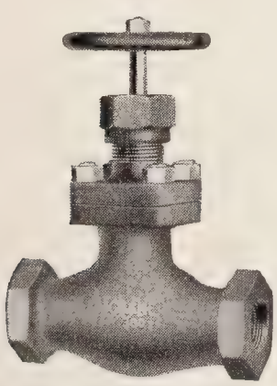
No. 1513
CODE: NABRUILOFT

No. 1517
CODE: NABUSSEAU

TONGUE AND GROOVE ENDS

Size.....Inches	¼	⅜	½	¾	1
Size.....Millimeters	6	10	13	19	25
No. 1513 Globe or No. 1517 Angle, without Companion Flanges, Bolts and Gaskets...Each	6.00	6.50	7.00	8.00	9.00
No. 1513 Globe or No. 1517 Angle, with Companion Flanges, Bolts and Gaskets.....Each	7.50	8.00	8.50	9.50	11.00

We will always furnish Flanged Valves complete with Companion Flanges, Gaskets and Bolts, unless otherwise specified.



No. 1519½
CODE: NACHACHTEN

No. 1519¾
CODE: NACHAHMEND

SCREWED ENDS

Size.....Inches	¼	⅜	½	¾	1
Size.....Millimeters	6	10	13	19	25
No. 1519½ Globe or No. 1519¾ Angle....Each	4.75	5.50	6.00	6.80	7.50
Center to End.....Inches	2¼	2⅜	2½	2¾	3⅛

For dimensions, see pages 669 and 670.
For drilling templates and tongue and groove dimensions, see page 674.
For description, see pages 502 and 503.

ALL-IRON

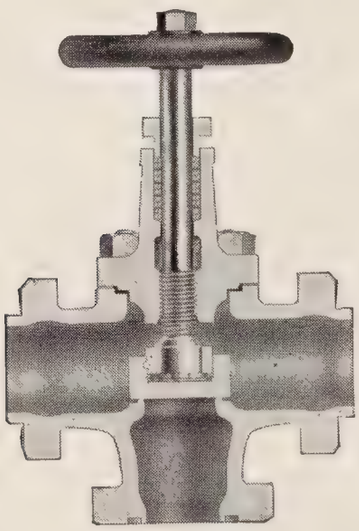
CROSS VALVES

(FERROSTEEL WITH SPECIAL METAL DISCS)

FOR AMMONIA, AIR, GAS, CHEMICALS AND OTHER SERVICES WHERE ALL-IRON CONSTRUCTION IS DESIRABLE

FOR WORKING PRESSURES UP TO 300 POUNDS

TONGUE AND GROOVE ENDS



No. 1510½
CODE: NACHALBERN

Style of Flange	Oval		Square				
Size.....Inches	½	¾	1	1¼	1½	2	2½
Size.....Millimeters	13	19	25	32	38	50	64
No. 1510½, without Companion Flanges, Bolts and Gaskets. Each	9.70	11.35	12.40	19.50	20.50	26.00	36.70
No. 1510½, with Companion Flanges, Bolts and Gaskets. Each	11.60	13.75	16.00	23.25	25.00	31 00	45.70

Style of Flange	Round				
Size.....Inches	3	3½	4	5	6
Size.....Millimeters	76	90	100	125	150
No. 1510½, without Companion Flanges, Bolts and Gaskets. . Each	56.00	72.40	93.00	134.00	179.00
No. 1510½, with Companion Flanges, Bolts and Gaskets. Each	71.00	89.40	113.00	157.00	209.00

We will always furnish Valves with Companion Flanges, Gaskets and Bolts, unless otherwise specified.

Cross Valves sizes larger than 6 inches made to order. Prices on application.

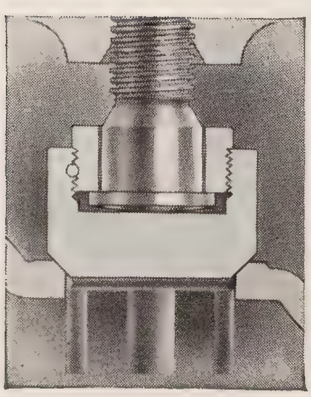
Cross Valves 1-inch and smaller can be furnished with screwed ends.

For dimensions, see pages 669 and 670.

For drilling templates and tongue and groove dimensions, see page 674.

VALVES WITH STEEL DISCS

Any of these valves can be furnished with special case-hardened discs. Construction as illustrated below.



Valves with all-steel discs in ¼, ⅜ and ½-inch sizes will be supplied at the same prices as similar valves with special metal disc rings. Sizes, ¾ to 6-inch, inclusive, will be furnished at the following additional cost over valves with regular metal disc rings:

Size.....Inches	¾	1	1¼	1½	2	2½	3	3½	4	5	6
Size.....Millimeters	13	25	32	38	50	64	76	90	100	125	150
Additional Cost..Each	1.00	1.30	1.70	2.30	2.65	2.70	5.40	6.30	6.75	8.25	8.80

Sizes, ¾-inch and larger have guide wings.

In ordering valves with **ALL-STEEL DISCS**, the number and size should be given and "**ALL-STEEL DISC**" specified.

Monel Metal Stems and Discs will be supplied on order.

ALL-IRON

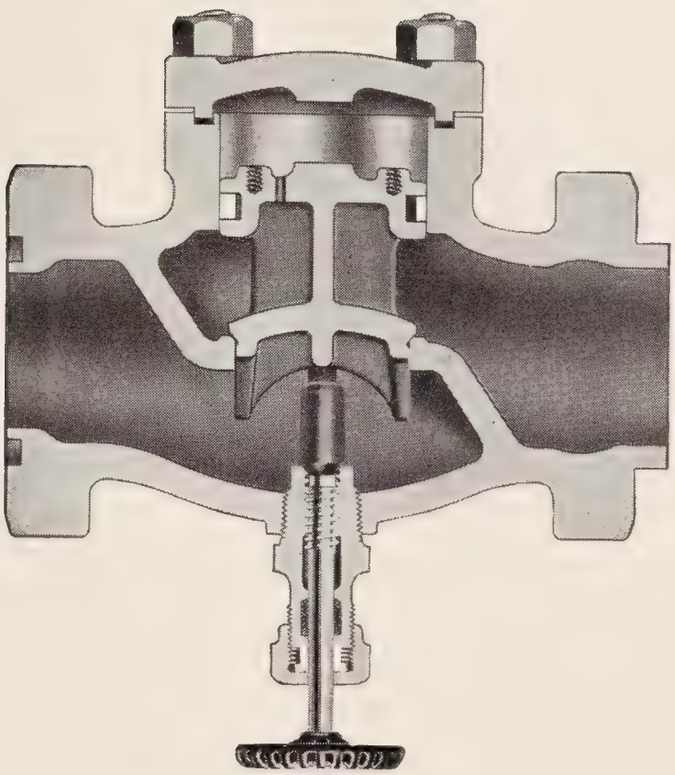
PISTON TYPE CUSHIONED CHECK VALVES

(FERROSTEEL)

FOR AMMONIA, AIR, GAS, CHEMICALS AND OTHER SERVICES WHERE ALL-IRON CONSTRUCTION IS DESIRABLE

FOR WORKING PRESSURES UP TO 300 POUNDS

TONGUE AND GROOVE ENDS



No. 1508½

Crane Horizontal Check Valves for Ammonia, sizes 1-inch and larger, both screwed and flanged, are regularly constructed with a disc-lifting device for pump-out purposes.

When pumping from the high side to the low side of the system through the by-passes on the main stop Valves, the by-pass lifting stem should be screwed in as far as possible, thus lifting and holding the check valve disc clear of the seat.

When the machine is in regular operation, this lifting stem should be **screwed out as far as possible,** thus freeing the disc and allowing it to function to its limit.

The application of this device to our Horizontal Check Valve eliminates connections which have to be made with the ordinary type of Check Valve to obtain the same results.

Crane Angle Check Valves are not equipped with by-pass lifting stems.

Our Check Valves are constructed with a dash pot, which prevents the disc from hammering, eliminates noise in operation and increases the durability of the valve.

In case of accident, Crane Check Valves close promptly, as the back pressure comes squarely on top of the disc.

These Valves have full opening throughout.

ALL-IRON

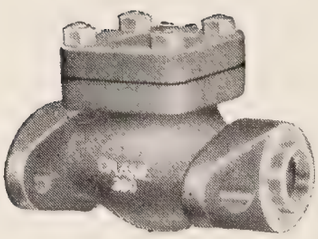
CHECK VALVES

(FERROSTEEL)

FOR AMMONIA, AIR, GAS, CHEMICALS AND OTHER SERVICES WHERE ALL-IRON CONSTRUCTION IS DESIRABLE

FOR WORKING PRESSURES UP TO 300 POUNDS

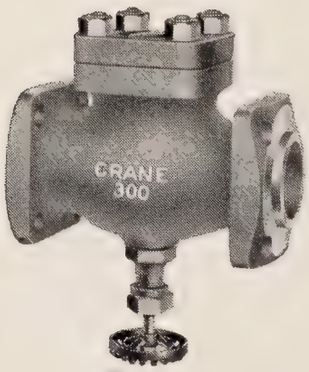
TONGUE AND GROOVE ENDS



No. 1507

HORIZONTAL WITHOUT LIFTING STEM

CODE: NACHBLUTEN



No. 1508½

HORIZONTAL WITH LIFTING STEM

CODE: NACHDEUTET

No. 1509, ANGLE

CODE: NACHERNTE

LIFTING STEMS ARE NOT APPLICABLE TO OUR ANGLE CHECK VALVES

Style of Flanges	Oval		Square					Round				
Size.....Inches	½	¾	1	1¼	1½	2	2½	3	3½	4	5	6
Size.....Millimeters	13	19	25	32	38	50	64	76	90	100	125	150
No. 1507 Horizontal or No. 1509 Angle, without Companion Flanges, Bolts and Gaskets.....Each Without lifting stem.	8.70	10.00	11.20	18.50	19.80	23.50	34.70	53.50	68.40	89.00	127.00	170.00
No. 1507 Horizontal or No. 1509 Angle, with Companion Flanges, Bolts and Gaskets...Each Without lifting stem.	10.05	11.30	13.05	21.25	22.55	27.20	40.20	62.80	79.80	102.30	143.65	192.15
No. 1508½ Horizontal without Companion Flanges, Bolts and Gaskets.....Each With lifting stem.	.....	.....	18.70	26.00	27.30	31.00	42.20	61.00	82.40	103.00	141.90	184.00
No. 1508½ Horizontal with Companion Flanges, Bolts and Gaskets.....Each With lifting stem.	.....	.....	20.55	28.75	30.05	34.70	47.70	70.30	93.80	116.30	157.65	206.15

We will always furnish Valves complete with Companion Flanges, Gaskets and Bolts, unless otherwise specified.

Check Valves sizes larger than 6 inches, made to order; prices on application.

For dimensions, see page 670.

For drilling templates and tongue and groove dimensions, see page 674.

ALL-IRON

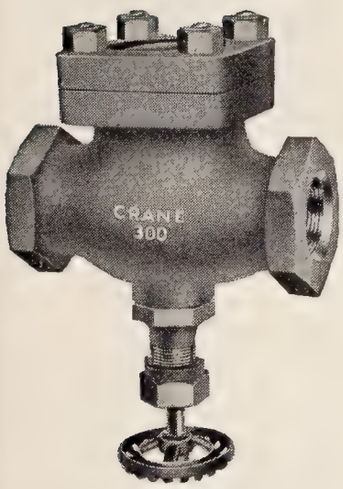
CHECK VALVES

(FERROSTEEL)

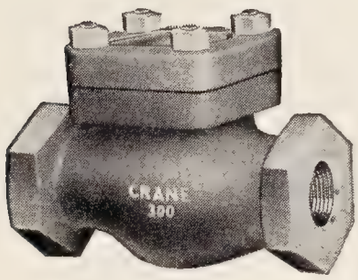
FOR AMMONIA, AIR, GAS, CHEMICALS AND OTHER SERVICES WHERE ALL-IRON CONSTRUCTION IS DESIRABLE

FOR WORKING PRESSURES UP TO 300 POUNDS

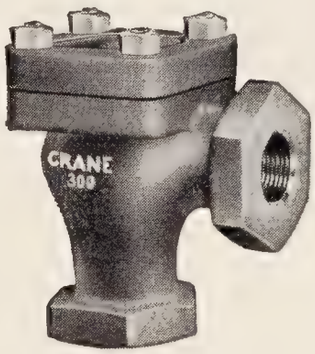
SCREWED ENDS



No. 1506½
WITH LIFTING STEM
CODE: NACHFROST



No. 1507½
WITHOUT LIFTING STEM
CODE: NACHGABE



No. 1509½
ANGLE
CODE: NACHGEBAUR

Size.....Inches	½	¾	1	1¼	1½	2
Size.....Millimeters	13	19	25	32	38	50
No. 1506½ Horizontal with Lifting Stem ...			12.65	15.40	17.05	20.05
No. 1507½ Horizontal or No. 1509½ Angle without Lifting Stem.....	6.80	7.25	8.00	10.75	12.40	15.40

Lifting Stems are not applicable to our Angle Check Valves.

For dimensions, see page 670.

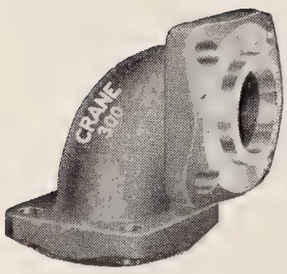
FLANGED ELBOWS

FERROSTEEL

FOR AMMONIA, AIR, GAS, CHEMICALS, ETC.

FOR WORKING PRESSURES UP TO 300 POUNDS

TONGUE AND GROOVE ENDS



No. 1521

CODE: NACHGEHEND

Size of Flanges	Oval				Square				
Size....Inches	¼	⅜	½	¾	1	1¼	1½	2	2½
Size....Millimeters	6	10	13	19	25	32	38	50	64
No. 1521, without Companion Flanges, Bolts and Gaskets....Each	1.00	1.25	1.40	1.75	2.00	2.25	2.50	3.00	5.50
No. 1521, with Companion Flanges, Bolts and Gaskets....Each	2.00	2.40	2.45	2.75	3.50	4.75	5.00	6.00	11.00

Style of Flanges	Round								
Size....Inches	3	3½	4	5	6	7	8	10	12
Size....Millimeters	76	90	100	125	150	175	200	250	300
No. 1521, without Companion Flanges, Bolts and Gaskets....Each	10.00	13.50	15.00	20.00	30.00	42.00	55.00	70.00	95.00
No. 1521, with Companion Flanges, Bolts and Gaskets....Each	13.50	17.00	21.00	28.50	40.00	55.00	70.00	90.00	115.00

We always will furnish Fittings with Companion Flanges, Gaskets and Bolts unless otherwise specified.

For dimensions, see pages 670 and 671.

For drilling templates, and tongue and groove dimensions, see page 674.

FLANGED TEES

FERROSTEEL

FOR AMMONIA, AIR, GAS, CHEMICALS, ETC.

WORKING PRESSURES UP TO 300 POUNDS

TONGUE AND GROOVE ENDS

No. 1523

CODE: NACHHEULEN

Style of Flanges	Oval				Square				
Size....Inches	¼	⅜	½	¾	1	1¼	1½	2	2½
Size....Millimeters	6	10	13	19	25	32	38	50	64
No. 1523, without Companion Flanges, Bolts and Gaskets....Each	1.50	1.75	1.95	2.20	2.50	3.70	3.75	4.00	8.00
No. 1523, with Companion Flanges, Bolts and Gaskets....Each	2.75	3.10	3.50	4.25	4.75	7.50	7.55	8.00	15.00

Style of Flanges	Round								
Size....Inches	3	3½	4	5	6	7	8	10	12
Size....Millimeters	76	90	100	125	150	175	200	250	300
No. 1523, without Companion Flanges, Bolts and Gaskets....Each	17.00	21.00	23.50	29.00	36.00	50.00	65.00	85.00	120.00
No. 1523, with Companion Flanges, Bolts and Gaskets....Each	26.00	31.00	34.50	43.00	53.00	70.00	95.00	130.00	170.00

We will always furnish Fittings complete with Companion Flanges, Gaskets and Bolts, unless otherwise specified.

For dimensions, see pages 670 and 671.

For drilling templates, and tongue and groove dimensions, see page 674.

For Flanged Reducing Tees, see page 516.

FLANGED REDUCING TEES

FERROSTEEL

FOR AMMONIA, AIR, GAS, CHEMICALS, ETC.

WORKING PRESSURES UP TO 300 POUNDS

No. 1525

TONGUE AND GROOVE ENDS

CODE: NACHKLAUBE

Size Inches	Size Millimeters	No. 1525, without Companion Flanges, Bolts and Gaskets Each	No. 1525, with Companion Flanges, Bolts and Gaskets Each
½ x ⅜	13 x 10	2.00	3.50
½ x ¾	13 x 19	2.00	3.75
¾ x ½	19 x 13	3.50	5.50
1 x ½	25 x 13	3.50	6.10
1¼ x ½	32 x 13	3.75	7.00
1¼ x ¾	32 x 19	3.75	7.00
1¼ x 2	32 x 50	3.75	8.00
1½ x ½	38 x 13	3.75	7.00
1½ x ¾	38 x 19	3.75	7.00
1½ x 1¼	38 x 32	3.75	7.00
1½ x 2	38 x 50	3.75	8.00
1½ x 2½	38 x 64	3.75	8.75
2 x ½	50 x 13	4.00	8.00
2 x ¾	50 x 19	4.00	8.00
2 x 1	50 x 25	4.00	8.00
2 x 1¼	50 x 32	4.00	8.00
2 x 1½	50 x 38	4.00	8.00
2 x 2½	50 x 64	5.50	11.50
2 x 3	50 x 76	8.25	14.50
2½ x 1¼	64 x 32	7.00	13.00
2½ x 1½	64 x 38	7.00	13.00
2½ x 2	64 x 50	7.25	13.25
2½ x 3	64 x 76	12.25	19.40
3 x 1¼	76 x 32	14.50	22.50
3 x 2	76 x 50	14.50	22.50
3 x 2½	76 x 64	15.30	24.50
3 x 4	76 x 100	21.55	33.70
3½ x 2	90 x 50	18.00	26.30
3½ x 2½	90 x 64	19.00	28.65
3½ x 3	90 x 76	22.50	33.75
4 x 2	100 x 50	20.60	30.00
4 x 2½	100 x 64	21.30	31.40
4 x 3	100 x 76	25.30	35.60
4 x 3 x 3	100 x 76 x 76	.....	.....
4 x 6	100 x 150	.....	.....
5 x 2	125 x 50	22.25	34.90
5 x 2½	125 x 64	23.60	36.20
5 x 3	125 x 76	27.80	40.60
5 x 4	125 x 100	30.75	45.20
6 x 2½	150 x 64	41.50	61.00
6 x 4	150 x 100	41.50	64.00
6 x 5	150 x 125	.....	.....

Size of opening determines shape of flange, viz. : openings ¼ to ¾ have oval flanges; 1 to 2½ square; 3 to 6, round.

For dimensions, see page 670.
For drilling templates and tongue and groove dimensions, see page 674.

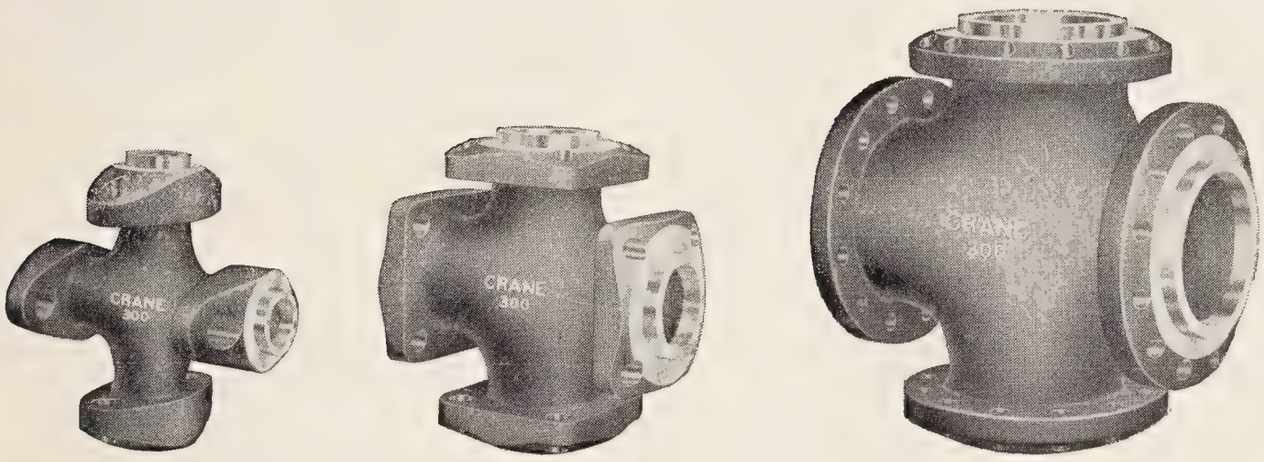
FLANGED CROSSES

FERROSTEEL

FOR AMMONIA, AIR, GAS, CHEMICALS, ETC.

WORKING PRESSURES UP TO 300 POUNDS

TONGUE AND GROOVE ENDS



No. 1527

CODE: NACHQUELLE

Style of Flanges	Oval				Square				
Size....Inches	¼	⅜	½	¾	1	1¼	1½	2	2½
Size....Millimeters	6	10	13	19	25	32	38	50	64
No. 1527, without Companion Flanges, Bolts and Gaskets....Each	1.75	2.40	2.50	3.00	3.30	4.95	5.00	6.00	10.00
No. 1527, with Companion Flanges, Bolts and Gaskets....Each	3.60	4.25	4.75	5.30	5.80	9.95	10.00	11.50	18.25

Style of Flanges	Round								
Size....Inches	3	3½	4	5	6	7	8	10	12
Size....Millimeters	76	90	100	125	150	175	200	250	300
No. 1527, without Companion Flanges, Bolts and Gaskets....Each	23.00	26.00	30.00	38.00	47.00	65.00	85.00	110.00	150.00
No. 1527, with Companion Flanges, Bolts and Gaskets....Each	31.00	37.00	44.00	53.00	65.00	90.00	125.00	165.00	220.00

We will always furnish Fittings complete with Companion Flanges, Gaskets and Bolts unless otherwise specified.

For dimensions, see pages 670 and 671.

For drilling templates, and tongue and groove dimensions, see page 674.

MALLEABLE IRON FITTINGS

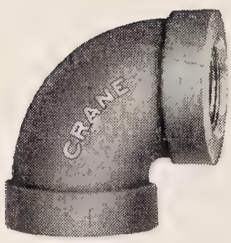
SCREWED ENDS WITH SOLDERING RECESS

HYDRAULIC PATTERN

FOB AMMONIA, AIR, GAS, ETC.

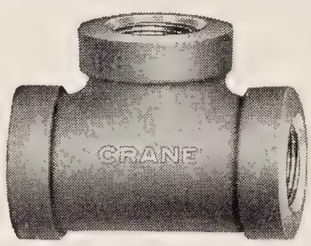
FOR WORKING PRESSURES UP TO 300 POUNDS

AIR TESTED

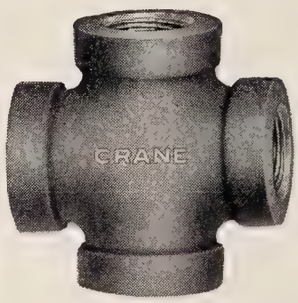


No. 1530
CODE: NACHSCHULE

No. 1532
CODE: NACHSTERBE

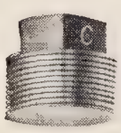


No. 1534
CODE: NACHWANKEN



No. 1538
CODE: NACKEDIG

No. 1539
CODE: NACKTSAMIG



No. 1540
CODE: NADELFORST

Size ... Inches	¼	⅜	½	¾	1	1¼	1½
Size ... Millimeters	6	10	13	19	25	32	38
No. 1530, Elbows ... Each	.20	.25	.30	.35	.40	.55	.70
No. 1532, 45° Elbows ... Each	.25	.30	.35	.42	.50	.65	.85
No. 1534, Tees ... Each	.30	.40	.45	.50	.60	.80	1.05
No. 1538, Crosses ... Each	.60	.80	.90	1.00	1.20	1.60	2.10
No. 1539, Reducers ... Each		.25	.28	.30	.40	.45	.55
Malleable Iron Face Bushings ... Each		.08	.09	.11	13	.17	.22
No. 1540, Solid Plugs, Cast Iron ... Each	.04	.04	.04	.06	.08	.09	.11

Size ... Inches	2	2½	3	3½	4	5	6
Size ... Millimeters	50	64	76	90	100	125	150
No. 1530, Elbows ... Each	.90	1.50	2.40	3 25	4.25	6.50	9.50
No. 1532, 45° Elbows ... Each	1.10	1.85	2.85	4.00	5.00		
No. 1534, Tees ... Each	1.35	2.25	3.60	5.00	6.50	9.75	14.25
No. 1538, Crosses ... Each	2.70	4.50	7.20	10.00	13.00	19.50	28.50
No. 1539, Reducers ... Each	.70	1.30	2.25				
Malleable Iron Face Bushings ... Each	.32	.48	.70	1.20	1.50	2.60	3.75
No. 1540, Solid Plugs, Cast Iron ... Each	.15	.27	.38	.57	.63	1.35	1.80

Reducing sizes Elbows, Tees and Crosses will be furnished at 15 per cent advance over straight sizes.

For list of sizes of reducing fittings carried in stock, see page 519.

For dimensions see page 646.

LIST OF SIZES OF MALLEABLE IRON

REDUCING FITTINGS

FOR AMMONIA, AIR, GAS, CHEMICALS

FOR WORKING PRESSURES UP TO 300 POUNDS

SCREWED ENDS **CARRIED IN STOCK**

REDUCING ELBOWS

¾ × ½	1½ × 1	2½ × 2
1 × ¾	2 × 1½	2½ × 1½
1¼ × 1	2 × 1¼	3 × 2½
1¼ × ¾	2 × 1	3 × 2
1¼ × ½	2 × ¾	
1½ × 1¼	2 × ½	

REDUCING TEES

½ × ⅜ × ½	1½ × 1½ × ¾	2½ × 2 × 2½
¾ × ¾ × ½	1½ × 1½ × ½	3 × 3 × 2
1 × 1 × ¾	1½ × 1¼ × 1½	3 × 3 × 1½
1 × 1 × ½	2 × 2 × 1½	3 × 2 × 3
1 × ¾ × 1	2 × 2 × 1¼	4 × 4 × 3
1¼ × 1¼ × 1	2 × 2 × 1	4 × 4 × 2½
1¼ × 1¼ × ¾	2 × 2 × ¾	4 × 4 × 2
1¼ × 1¼ × ½	2 × 2 × ½	4 × 3 × 4
1¼ × 1 × 1¼	2 × 1½ × 2	5 × 5 × 4
1¼ × 1 × 1	2 × 1 × 2	6 × 6 × 4
1½ × 1½ × 1¼	2½ × 2½ × 2	6 × 6 × 3
1½ × 1½ × 1	2½ × 2½ × 1½	

REDUCERS

⅜ × ¼	1¼ × 1	1½ × ¾	2 × ½
½ × ⅜	1¼ × ¾	1½ × ½	2½ × 2
¾ × ½	1¼ × ½	2 × 1½	3 × 2½
1 × ¾	1½ × 1¼	2 × 1¼	3 × 2
1 × ½	1½ × 1	2 × 1	3 × 1½

The above Reducing Fittings are carried in stock. Other sizes will be made to order by bushing in the sand.

Reducing sizes Elbows, Tees and Crosses will be furnished at 15 per cent. advance over straight sizes.

FACE BUSHINGS

MALLEABLE IRON

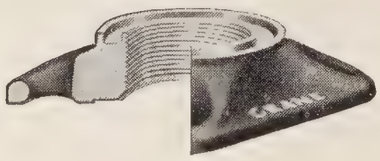
Size	Size	Size	Size	Size
⅜ × ¼	1¼ × ¾	2 × 1¼	3½ × 2	4½ × 4
	1¼ × 1	2 × 1½	3½ × 2½	
½ × ⅜			3½ × 3	*5 × 3
	1½ × ¾	2½ × 1¼		5 × 4
¾ × ⅜	1½ × 1	2½ × 1½		5 × 4½
¾ × ½	1½ × 1¼	2½ × 2		
			*4 × 2	*6 × 3
		3 × 1½	4 × 2½	*6 × 4
1 × ½	2 × ¾	3 × 2	4 × 3	6 × 5
1 × ¾	2 × 1	3 × 2½	4 × 3½	

*These sizes are made in Cast Iron only.

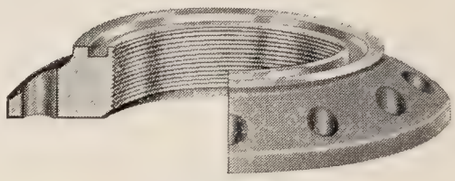
COMPANION FLANGES

FORGED STEEL, MALLEABLE IRON AND FERROSTEEL
FOR AMMONIA, AIR, GAS, CHEMICALS AND OTHER SERVICES WHERE
ALL-IRON CONSTRUCTION IS DESIRABLE
FOR WORKING PRESSURES UP TO 300 POUNDS

OVAL



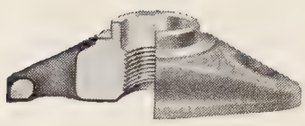
SQUARE



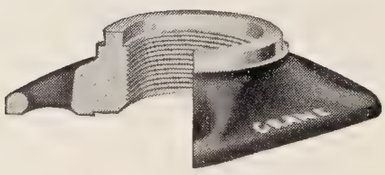
ROUND

No. 1545, GROOVE

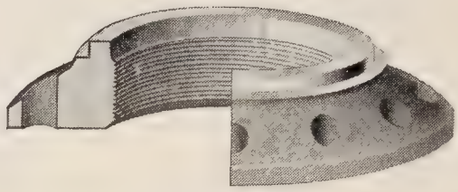
CODE: NADELROHR



OVAL



SQUARE



ROUND

No. 1547, TONGUE

CODE: NAGESCHALD

Style of Flange	Size Inches	Size Millimeters	No. 1545 Groove or No. 1547 Tongue Forged Steel Without Bolts or Gasket Price Each	No. 1545 Groove or No. 1547 Tongue Forged Steel With Bolts and Gasket Price Each	No. 1545 Groove or No. 1547 Tongue Malleable Iron Without Bolts and Gasket Price Each	No. 1545 Groove or No. 1547 Tongue Malleable Iron With Bolts and Gasket Price Each	No. 1545 Groove or No. 1547 Tongue Ferrosteel Without Bolts and Gasket Price Each	No. 1545 Groove or No. 1547 Tongue Ferrosteel With Bolts and Gasket Price Each
Oval	¼	6	.40	.50				
	⅜	10	.45	.55				
	½	13	.50	.70				
	¾	19	.65	.90				
Square	1	25	.95	1.20				
	1¼	32	1.00	1.25				
	1½	38	1.20	1.50				
	2	50	1.40	1.70				
Round	2½	64			2.50	3.00		
	3	76			3.00	3.75		
	3½	90			3.50	4.25		
	4	100			4.25	5.00		
	5	125			5.25	5.75		
	6	150			6.25	7.50		
	7	175					7.50	8.50
	8	200					9.00	11.00
	10	250					12.50	15.50
	12	300					18.50	21.50

Unless otherwise specified we will always furnish flanges without Bolts and Gaskets.

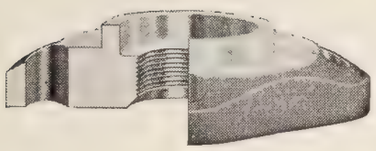
For dimensions, see page 674.
For drilling template, and tongue and groove dimensions, see page 674.

REDUCING COMPANION FLANGES

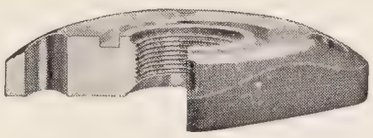
FORGED STEEL, MALLEABLE IRON AND FERROSTEEL

FOR AMMONIA, AIR, GAS, CHEMICALS AND OTHER SERVICES WHERE ALL-IRON CONSTRUCTION IS DESIRABLE

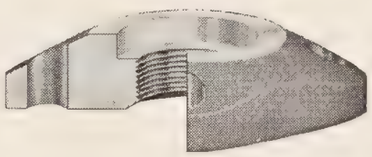
FOR WORKING PRESSURES UP TO 300 POUNDS



TONGUE
No. 1549
CODE: NAGEVIJLD



GROOVE
No. 1551
CODE: NAHIPPELEN



BOYLE
No. 1554
CODE: NAIVEMENT

Size Inches	Style of Flange	No. 1549 Tongue No. 1551 Grove or No. 1554 Boyle: Without Bolts and Gasket Each	With Bolts and Gaskets Each
3/8x 1/4..	Oval	.45	.55
1/2x 3/8..		.50	.70
1/2x 1/4..		.50	.70
3/4x 1/2..		.65	.90
3/4x 3/8..		.65	.90
3/4x 1/4..		.65	.90
1 x 3/4..	Square	.95	1.20
1 x 1/2..		.95	1.20
1 x 3/8..		.95	1.20
1 x 1/4..		.95	1.20
1 1/4x1 ..		1.00	1.25
1 1/4x 3/4..		1.00	1.25
1 1/4x 1/2..		1.00	1.25
1 1/4x 3/8..		1.00	1.25
1 1/4x 1/4..		1.00	1.25
1 1/2x1 1/4..		1.20	1.50
1 1/2x1 ..		1.20	1.50
1 1/2x 3/4..		1.20	1.50
2 x1 1/2..		1.40	1.70
2 x1 1/4..		1.40	1.70
2 x1 ..		1.40	1.70

Size Inches	Style of Flanges	No. 1549 Tongue No. 1551 Groove or No. 1554 Boyle: Without Bolts and Gasket Each	With Bolts and Gasket Each
2 x 3/4..	Square	1.40	1.70
2 x 1/2..		1.40	1.70
2 x 3/8..		1.40	1.70
2 x 1/4..		1.40	1.70
2 1/2x2 ..		2.50	3.00
2 1/2x1 1/2..		2.50	3.00
2 1/2x1 1/4..		2.50	3.00
3 x2 1/2..	Round	3.00	3.75
3 x2 ..		3.00	3.75
3 x1 1/2..		3.00	3.75
3 1/2x3 ..		3.50	4.25
3 1/2x2 1/2..		3.50	4.25
3 1/2x2 ..		3.50	4.25
4 x3 1/2..		4.25	5.00
4 x3 ..		4.25	5.00
4 x2 1/2..		4.25	5.00
4 x2 ..		4.25	5.00
5 x4 ..		5.25	5.75
5 x3 1/2..		5.25	5.75
6 x5 ..		6.25	7.50
6 x4 ..		6.25	7.50

Nos. 1549 and 1551 Reducing Flanges 2-inch and smaller, forged steel; 2½-inch to 6-inch, malleable iron; 7-inch to 12-inch, ferrosteel.

No. 1554 Boyle Flanges are made of cast iron.

Unless otherwise specified we always will furnish Flanges without Bolts and Gaskets.

For dimensions, see page 674.

For drilling Templates and Tongue and Groove Dimensions, see page 674.

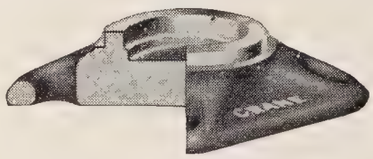
BLIND FLANGES

FORGED STEEL, MALLEABLE IRON AND FERROSTEEL

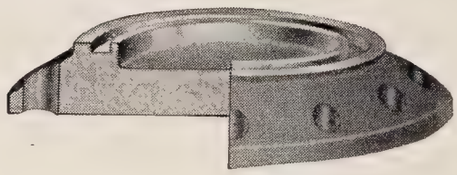
FOR AMMONIA, AIR, GAS, CHEMICALS AND OTHER SERVICES WHERE ALL-IRON CONSTRUCTION IS DESIRABLE

FOR WORKING PRESSURES UP TO 300 POUNDS

NO 1557 GROOVE
CODE: NAMADARY



NO. 1555 TONGUE
CODE: NALANGOU

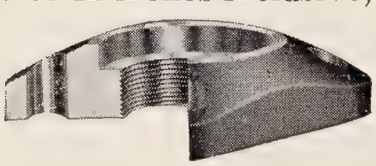


NO. 1557 GROOVE

Style of Flanges	Oval				Square				
Size, Inches	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2
Size, Millimeters	6	10	13	19	25	32	38	50	64
No. 1555, Tongue without Bolts or Gasket, Each	.40	.45	.50	.65	.95	1.00	1.20	1.40	2.50
No. 1555, Tongue with Bolts and Gasket, Each	.50	.55	.70	.90	1.20	1.25	1.50	1.70	3.00
No. 1557, Groove without Bolts or Gasket, Each	.40	.45	.50	.65	.95	1.00	1.20	1.40	2.50
No. 1557, Groove with Bolts and Gasket, Each	.50	.55	.70	.90	1.20	1.25	1.50	1.70	3.00

Style of Flanges	Round								
Size, Inches	3	3 1/2	4	5	6	7	8	10	12
Size, Millimeters	76	90	100	125	150	175	200	250	300
No. 1555, Tongue without Bolts or Gasket, Each	3.00	3.50	4.25	5.25	6.25	7.50	9.00	12.50	18.50
No. 1555, Tongue with Bolts and Gasket, Each	3.75	4.25	5.00	5.75	7.50	8.50	11.00	15.50	21.50
No. 1557, Groove without Bolts or Gasket, Each	3.00	3.50	4.25	5.25	6.25	7.50	9.00	12.50	18.50
No. 1557, Groove with Bolts and Gasket, Each	3.75	4.25	5.00	5.75	7.50	8.50	11.00	15.50	21.50

Sizes 2-inch and smaller, Forged Steel; 2 1/2 to 6-inch inclusive, Malleable Iron; 7 to 12 inches inclusive, Ferrosteel.



NO. 1553
BOYLE FLANGES
CODE: NARPICHERA

BOYLE FLANGES

FOR AMMONIA

CAST IRON

Style of Flanges	Oval				Square		
Size, Inches	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2
Size, Millimeters	6	10	13	19	25	32	38
Price, with Bolts and Gaskets, Each	.50	.55	.70	.90	1.20	1.25	1.50

Style of Flanges	Square		Round				
Size, Inches	2	2 1/2	3	3 1/2	4	5	6
Size, Millimeters	50	64	76	90	100	125	150
Price, with Bolts and Gaskets, Each	1.70	3.00	3.75	4.25	5.00	5.75	7.50

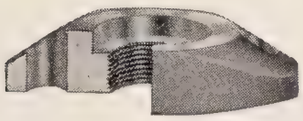
Unless otherwise specified we will always furnish flanges without Bolts and Gaskets.

For dimensions, see page 674.

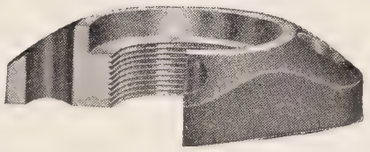
Templates for drilling, and Tongue and Groove dimensions, see page 674.

FLANGES AND GLANDS FOR USE ON CONDENSERS

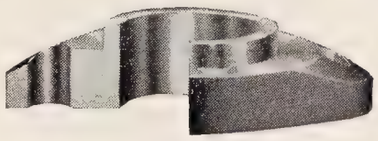
HAVING DOUBLE PIPE RETURN BENDS AND SPECIAL TEES



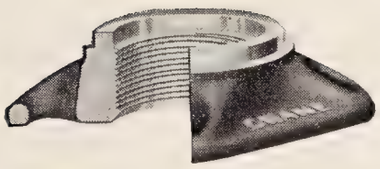
NO. 1583
CAST IRON BOYLE FLANGE
CODE: NARRENBAD



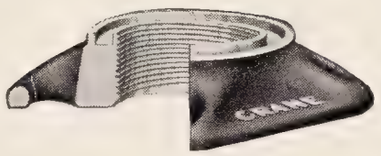
NO. 1584
CAST IRON BOYLE FLANGE
CODE: NARRENRUHM



NO. 1582 FERROSTEEL, GLAND
CODE: NARRATIVA



NO. 1582½
FORGED STEEL, TONGUE
CODE: NARRBOLD



NO. 1583½
FORGED STEEL, GROOVE
CODE: NARRENLAUF

Style of Flanges	Oval		Square		Rectangular	
Size, Inches	1¼	2	2	3	2	2½
Size, Millimeters	32	50	50	76	50	64
No. 1582, Gland, without Bolts and Gasket, Each	.60	.85				
No. 1582, Gland, with Bolts and Gasket, Each	.75	1.00				
No. 1582½ Tongue Flange, without Bolts and Gaskets, Each			.85			
No. 1582½, Tongue Flange, with Bolts and Gaskets, Each			1.00			
No. 1583, Boyle Flange, without Bolts and Gasket, Each	.60	.85	.85	1.80		
No. 1583, Boyle Flange, with Bolts and Gasket, Each	.75	1.00	1.00	2.25		
No. 1583½, Groove Flange, without Bolts and Gasket, Each			.85			
No. 1583½, Groove Flange, with Bolts and Gasket, Each			1.00			
No. 1584, Boyle Flange, without Bolts and Gasket, Each					1.50	1.50
No. 1584, Boyle Flange, with Bolts and Gasket, Each					1.80	1.80

No. 1582 special oval glands are used on double pipe return bends for condensers and brine coolers.

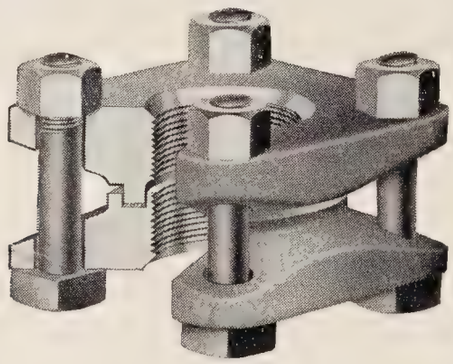
No. 1583 special square Boyle flanges are used on double pipe return bends for condensers and brine coolers and on special reducing tees. The 1583½ 2-inch special square groove flange in addition to being used on 2x4⅝-inch return bends with tongue and groove ends, may be used interchangeably with the 2-inch No. 1583 Boyle flange.

FLANGE UNIONS MADE FROM COMPANION FLANGES

¼ TO 2-INCH, FORGED STEEL; 2½ TO 6-INCH, MALLEABLE IRON; 7 TO 12-INCH, FERROSTEEL

FOR AMMONIA, AIR, GAS, CHEMICALS AND OTHER SERVICES WHERE ALL IRON CONSTRUCTION IS DESIRABLE

FOR WORKING PRESSURES UP TO 300 POUNDS



No. 1589
CODE: NARRETUIG

Style of Flanges	Oval				Square				
Size—Inches	¼	⅜	½	¾	1	1¼	1½	2	2½
Size—Millimeters	6	10	13	19	25	32	38	50	64
No. 1589—Each	.90	1.00	1.20	1.55	2.15	2.25	2.70	3.10	5.50
Style of Flanges	Round								
Size—Inches	3	3½	4	5	6	7	8	9	10
Size—Millimeters	76	90	100	125	150	175	200	225	250
No. 1589—Each	6.75	7.75	9.25	11.00	13.75	16.00	20.00	28.00	40.00

These unions consist of our No. 1547 tongue and No. 1545 groove flanges bolted together, with "Cranite" gasket.

We can make all reductions in this fitting by the combination of our No. 1547 and No. 1551 Companion Flanges.

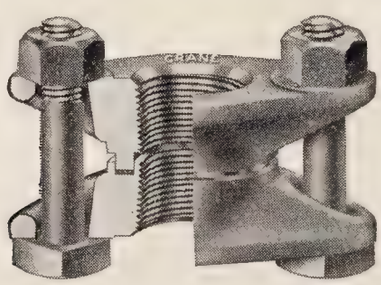
For dimensions see page 674.

Templates for drilling, and tongue and groove dimensions, see page 674.

OVAL AND SQUARE FLANGE UNIONS

FOR AMMONIA, AIR, GAS, CHEMICALS

WORKING PRESSURES UP TO 300 POUNDS



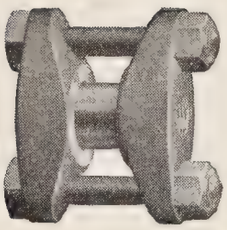
No. 1591½ FORGED STEEL
CODE: NARTHECUM

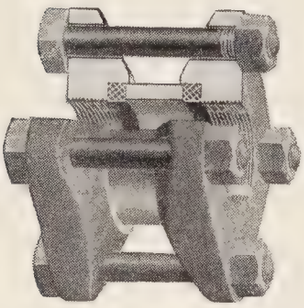
Style of Flanges	Oval		Square
Size—Inches	1	1¼	2
Size—Millimeters	25	32	50
Price—Each	1.50	1.75	2.80
Dimension of Flange—Inches	2⅜x4½	2 11/16x5¼	4½

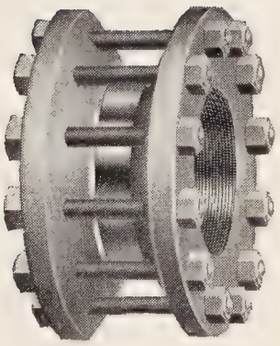
For tongue and groove dimensions, see page 674.

BOYLE UNIONS

FOR AMMONIA







No. 1585 CAST IRON

CODE: NARWALLEN

Style of Flanges.....	Oval				Square				
Size.....Inches	¼	⅜	½	¾	1	1¼	1½	2	2½
Size.....Millimeters	6	10	13	19	25	32	38	50	64
No. 1585.....Each	1.05	1.15	1.35	1.60	1.95	2.65	3.10	3.70	6.25

Style of Flanges.....	Round							
Size.....Inches	3	3½	4	5	6			
Size.....Millimeters	76	90	100	125	150			
No. 1585.....Each	9.50	11.50	13.65	18.00	22.00			

For dimensions, see page 674.
For extra fillers, see page 531.

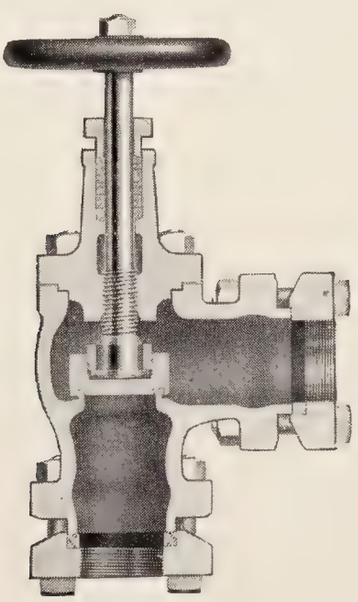
BOYLE (TONGUE) END

VALVES AND FITTINGS

FOR AMMONIA

FERROSTEEL SPECIAL METAL DISCS

COLD ROLLED STEEL STEMS



Valves and fittings with Boyle ends (all ends tongued) will be made to order only.

Either Boyle or groove flanges may be used with valves and fittings with Boyle ends.

Prices on application.

GASKETS FOR TONGUE AND GROOVE AND BOYLE JOINTS

FOR AMMONIA, AIR, GAS AND ALSO CHEMICALS WHERE ALL-IRON MATERIAL FILLS THE REQUIREMENTS

GASKETS FOR TONGUE AND GROOVE JOINTS
CODE: NASITERNA

RUBBER GASKETS FOR BOYLE JOINTS
CODE: NASPOORDER

Ring Gaskets for Tongue and Groove Joints						Rubber Gaskets for Boyle Joints		
Size of Valve or Fitting Inches	Size of Valve or Fitting Millimeters	1/16-Inch Cranite Gaskets Per Doz.	1/16-Inch Rubber Gaskets Per Doz.	1/16-Inch Lead Gaskets Per Doz.	Inside and Outside Diameters	Canvas Wrapped or Plain Square Boyle Gaskets Per Doz.	Thickness of Gaskets	Inside and Outside Diameters
1/4	6	.25	.25	.45	19/32x31/32	1.40	1/4	9/16x1
3/8	10	.30	.30	.50	23/32x1 3/32	1.60	1/4	11/16x1 1/8
1/2	13	.30	.30	.50	7/8x1 7/32	1.85	1/4	13/16x1 1/4
3/4	19	.40	.40	.70	1 1/8x1 15/32	2.10	1/4	1 1/16x1 1/2
1	25	.40	.40	.90	1 3/8x1 25/32	2.60	1/4	1 11/32x1 13/16
1 1/4	32	.50	.50	1.25	1 11/16x2 7/32	5.00	3/8	1 11/16x2 1/4
1 1/2	38	.50	.50	1.25	1 15/16x2 15/32	5.30	3/8	1 15/16x2 1/2
2	50	.55	.55	1.50	2 7/16x3 3/32	8.10	3/8	2 7/16x3 1/8
2 1/2	64	.60	.60	1.70	2 15/16x3 21/32	13.20	1/2	2 29/32x3 11/16
3	76	.70	.70	1.85	3 9/16x4 3/32	16.80	1/2	3 9/16x4 5/16
3 1/2	90	.85	.85	2.15	4 1/16x4 27/32	21.00	1/2	4 1/16x4 7/8
4	100	1.00	1.00	2.40	4 9/16x5 15/32	26.00	1/2	4 9/16x5 1/2
5	125	1.20	1.20	2.70	5 5/8x6 27/32	49.00	5/8	5 5/8x6 7/8
6	150	1.50	1.50	3.50	6 11/16x7 27/32	60.00	5/8	6 11/16x7 7/8
7	175	1.80	1.80	4.20	8 5/8x9 5/8			
8	200	2.40	2.40	4.80	9 5/8x10 7/8			
10	250	3.00	3.00	5.60	11 5/8x13 1/8			
12	300	3.75	3.75	6.50	13 5/8x15 1/8			

COMPLETE SETS OF VALVE STUFFING-BOX PACKINGS FOR AMMONIA, AIR, GAS AND CHEMICALS WHERE ALL-IRON MATERIAL FILLS THE REQUIREMENTS

Size of Valve, Inches		1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	5	6
No. 1501 No. 1503 No. 1504 No. 1505	Net Per Set	.05	.05	.05	.10	.10	.15	.15	.21	.21	.24	.24	.49	.49	.60
No. 1504 1/2 No. 1505 1/2	Net Per Set	.06	.06	.06	.07	.07									
Expansion Valves		.08	.08	.08	.08	.08									

When ordering give size and catalogue number of Valve.

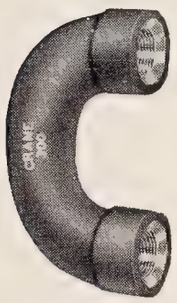
RETURN BENDS

MALLEABLE IRON

FOR AMMONIA, AIR, GAS, CHEMICALS AND OTHER SERVICES WHERE ALL-IRON CONSTRUCTION IS DESIRABLE

FOR WORKING PRESSURES UP TO 300 POUNDS

SCREWED ENDS

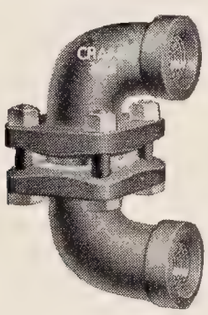


No. 1562
CODE: NASTRIJKEN

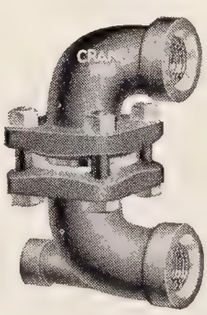
No. 1564
CODE: NASUTENESS

Size.....Inches	1	1	1	1¼	1¼	1¼	1¼	1¼	1¼
Size.....Millimeters	25	25	25	32	32	32	32	32	32
Center to Center.....Inches	1¾	2½	3	2¼	2½	3	3½	4	6
No. 1562, Plain.....Each	.60	.75	.85	.90	.95	1.00	1.15	1.20	1.55
No. 1564, with ½-inch Back Outlet.....Each									1.90
Size.....Inches	1½	1½	1½	2	2	2	2	2	2
Size.....Millimeters	38	38	38	50	50	50	50	50	50
Center to Center.....Inches	3	6	8	3	3½	4	4⅝	6	8
No. 1562, Plain.....Each	1.15	1.75	2.00	1.25	1.30	1.90	2.25	3.25	3.50
No. 1564, with ½-inch Back Outlet.....Each					2.15	2.25			

An extra price is charged for tapping right and left.
For dimensions, see page 673.



No. 1570
CODE: NASUTULIUS



No. 1572
CODE: NATABILIA

Size.....Inches	1¼	1¼	2	2	2	2
Size.....Millimeters	32	32	50	50	50	50
Center to Center.....Inches	4	6	3½	4	4⅝	6
No. 1570, Plain.....Each	2.50	2.70	4.40	4.75	5.00	6.00
No. 1572, with Back Outlet.....Each		3.15	4.85	5.20	5.45	
Size of Back Outlet.....Inches		½		½		

These bends may be divided and used as condenser fittings or as screwed and Flanged Elbows.

For dimensions, see page 673.
For Flange dimensions, see page 674.

Sizes not shown—prices on application.

RETURN BENDS

FERROSTEEL

FOR AMMONIA, AIR, GAS, CHEMICALS AND OTHER SERVICES WHERE ALL-IRON CONSTRUCTION IS DESIRABLE

FOR WORKING PRESSURES UP TO 300 POUNDS

FLANGED ENDS

No. 1559

CODE: NATABUDES

TONGUE AND GROOVE

No. 1561

CODE: NATAREMINI

Size.....Inches	1¼	1¼	*2	2	2	2	2
Size.....Millimeters	32	32	50	50	50	50	50
Center to Center.....Inches	4	6	4⅝	6	8	10	12
No. 1559, Plain, without Flanges, Bolts and Gaskets.....Each	1.90	2.40	2.60	2.85	3.40	4.25	5.10
No. 1559, Plain, with Flanges, Bolts and Gaskets.....Each	3.40	3.90	4.60	4.85	5.40	6.25	7.10
No. 1561, with Back Outlet, without Flanges, Bolts and Gaskets..Each	2.30	2.90	3.10	3.40			
No. 1561, with Back Outlet, with Flanges, Bolts and Gaskets...Each	4.15	4.75	5.45	5.75			
Size of Back Outlet.....Each	½	½	½	½			
Size of Back Outlet.....Millimeters	13	13	13	13			

*On tongue and groove end return bends, with 4⅝-inch centers, it is necessary to use special square flanges, prices of which are given on page 523. Standard flanges are used on all other sizes.

We will always furnish Fittings with Companion Flanges, Gaskets and Bolts, unless otherwise specified.

The back outlet is Tongued.

For dimensions, see page 673.

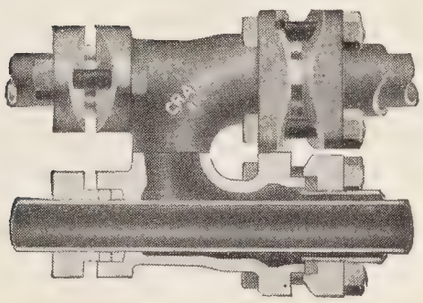
For Drilling Templates and Tongue and Groove dimensions, see page 674.

DOUBLE PIPE RETURN BENDS

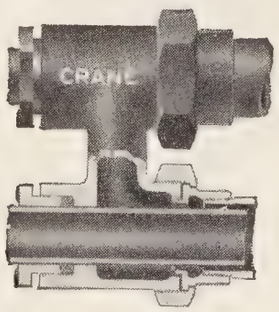
FERROSTEEL

FOR CONDENSERS, BRINE COOLERS, WATER COOLERS AND HEAT EXCHANGERS

FOR WORKING PRESSURES UP TO 300 POUNDS



No. 1575
CODE: NATATOTE



No. 1575½
CODE: NATEMENDE

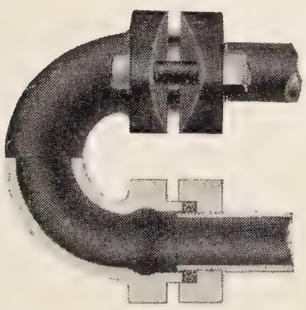
Size	Inches	2x1¼	2½x1¼	2½x2x1¼	3x2	4x3
Size	Millimeters	50x32	64x32	64x50x32	76x50	100x76
Center to Center	Inches	4⅝	4⅝	4⅝	6	8
No. 1575, Return Bends without Companion Flanges, Glands, Bolts and Gaskets	Each	4.55	5.25	5.25	7.50	*
No. 1575, Return Bends, Complete as Shown	Each	8.00	10.35	10.35	14.00	*
No. 1575½, Water Cooler, Return Bends, Complete as Shown	Each	Black 4.75 Galv. 6.50				

*Prices on Application.

RETURN BENDS

FERROSTEEL

FOR DOUBLE PIPE CONDENSERS, BRINE COOLERS, WATER COOLERS AND HEAT EXCHANGERS



No. 1574
CODE: NATEVOLE

No. 1574½
CODE: NATICHELLA

Size	Inches	1¼	2	3
Size	Millimeters	32	50	76
Center to Center	Inches	4⅝	6	8
No. 1574, Return Bends, without Companion Flanges, Bolts and Gaskets	Each	1.75	2.45	
No. 1574, Return Bends, Complete as Shown	Each	3.25	4.45	
No. 1574½, Return Bends	Each	1.60	3.00	*

No. 1574 Bends have both ends tongue.

Unless otherwise specified, we will always furnish Bends complete with Companion Flanges, Glands Gaskets and Bolts.

Either No. 1583 Boyle or No. 1583½ Groove Flanges will be furnished with Double Pipe Return Bends. Bends are carried in stock with No. 1583 Boyle Flanges.

Crane Double Pipe Return Bends are so constructed that a particular bend may be removed, thus permitting a section of pipe being taken out of any part of a condenser or cooler without tearing down the entire stand.

This construction also makes it possible to easily detect leaky joints.

Double Pipe Bends for condensers and coolers are identical in design, the only difference being in the size.

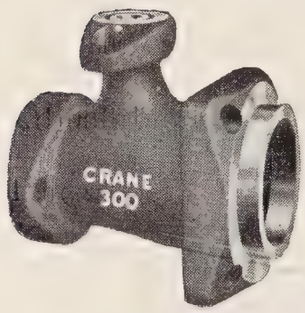
For dimensions, see page 672.

*Prices on Application.

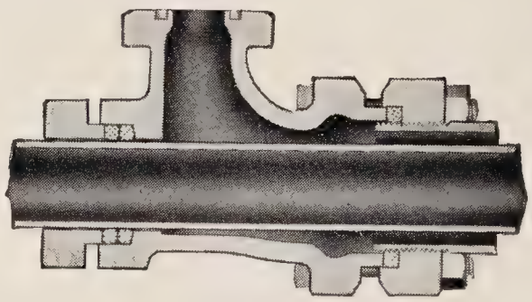
SPECIAL INLET AND OUTLET TEES

FERROSTEEL

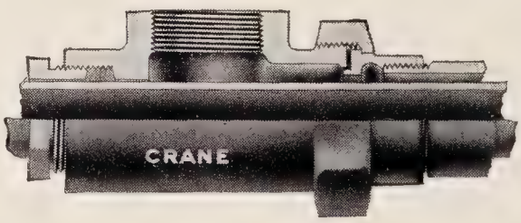
FOR DOUBLE PIPE AMMONIA CONDENSERS, BRINE COOLERS, WATER COOLERS AND HEAT EXCHANGERS



No. 1579 INLET AND OUTLET
CONDENSER TEE
CODE: NATINATIUS



No. 1581 INLET AND OUTLET
BRINE COOLER TEE
CODE: NATIVIDADE



No. 1575¾
INLET AND OUTLET WATER COOLER TEE
CODE: NATINAMUR

SIZE	No. 1575¾		No. 1579		No. 1581	
	Complete as Shown Above		Without Flange, Gland, Bolts and Gaskets	With Flange, Gland, Bolts and Gaskets	Without Flange, Gland, Bolts and Gaskets	Complete as Shown Above
	Black Each	Galv. Each	Each	Each	Each	Each
2x1¼x½			4.00	6.45		
2x1¼x ¾			4.00	6.45		
2x1¼x1			4.25	6.70		
2x1¼x1¼			4.25	6.70		
2x1¼x1½			4.25	6.70		
2x1¼x2	4.50	6.25	4.25	6.70		
2½x1¼x2			4.75	8.30		
3x2 x ½					9.00	13.50
3x2 x ¾					9.00	13.50
3x2x1¼					9.50	14.00
3x2x1½					9.50	14.00
3x2 x2					9.50	14.00
4x3 x3					*	*

Unless otherwise specified we will always furnish Tees complete with companion Flange, Gland, Gaskets and Bolts for the run, but no Companion Flange for the side outlet, as this is not included in the above prices.

Either No. 1583 Boyle Flange or No. 1583½ Groove Flange will be furnished with Ammonia Tees at the above prices; however, these Tees are carried in stock with No. 1583 Boyle Flanges only.

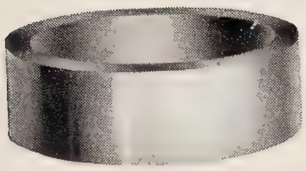
For special Companion Flanges and Glands, see page 523.

Water Cooler Tees are carried in stock Galvanized only.

For Dimensions, see page 676.

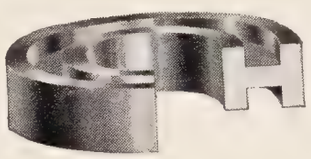
*Prices on Application.

FERROSTEEL FILLERS



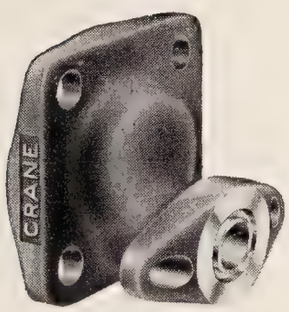
No. 1586
CODE: NATRONGLAS

These Ferrosteel Fillers are used when bolting together two tongue or two groove flanges.



No. 1586¼
CODE: NATTERHAUT

Size.....Inches	¼	⅜	½	¾	1	1¼	1½	2
Size.....Millimeters	6	10	13	19	25	32	38	50
No. 1586.....Each	.25	.25	.30	.30	.30	.30	.35	.35
No. 1586¼.....Each	1.00	1.00	1.00	1.00	1.00	1.50	1.50	1.50
Size.....Inches	2½	3	3½	4	5	6	7	8
Size.....Millimeters	64	76	90	100	125	150	175	200
No. 1586.....Each	.45	.45	.95	.95	1.40	1.50	2.00	2.50
Nc. 1586¼.....Each	2.25	2.25	2.40	3.35	3.55	3.65	5.00	5.20



No. 1573½
CODE: NATURALONE

SPECIAL ECCENTRIC REDUCERS

FERROSTEEL FOR ATMOSPHERIC AMMONIA CONDENSERS

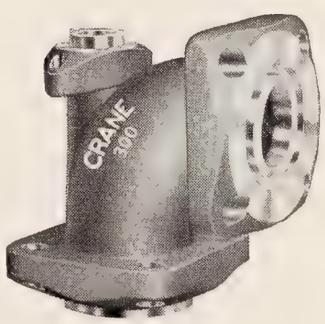
Size.....Inches	2 x ¾
Size.....Millimeters	50 x 19
No. 1573½, without Companion Flanges, Bolts and Gaskets.....Each	4.00

BACK OUTLET ELBOWS

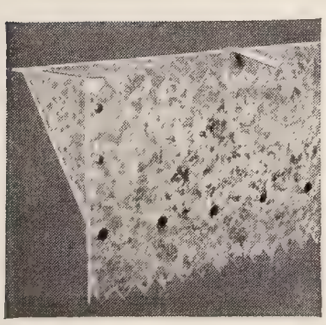
FERROSTEEL FOR AMMONIA CONDENSERS

Size.....Inches	1¼	1½	2
Size.....Millimeters	32	38	50
No. 1578, with Back Outlet, without Flanges, Bolts and Gaskets.....Each	5.00	5.25	5.50
Size of Back Outlet.....Inches	½	½	½
Size of back outlet.....Millimeters	13	13	13

For Special Companion Flanges and Glands, see page 523.



No. 1578
CODE: NATURBAHN



CODE: NATURBODEN

GALVANIZED WATER TROUGHS

FOR ATMOSPHERIC AMMONIA CONDENSERS

Water Troughs of any size and style will be made to order. Prices on application.

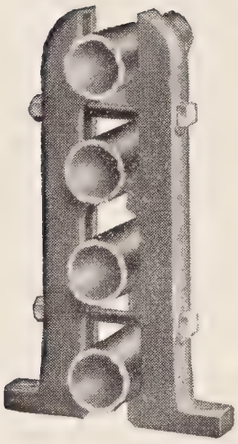
We recommend these troughs as superior to ordinary troughs in design, material and workmanship.

PIPE STANDS

CAST IRON

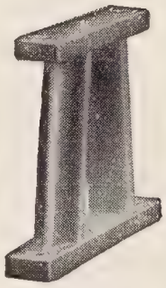
FOR CONDENSERS, BRINE COOLERS, WATER COOLERS, AND HEAT EXCHANGERS

HEADER SUPPORT
CODE: NATURSCHON

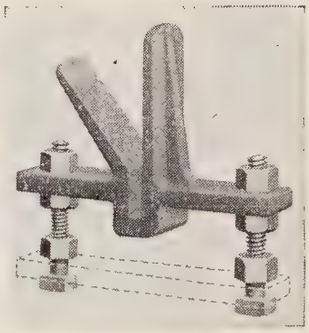


TOP SECTION
CODE: NATURKETTE

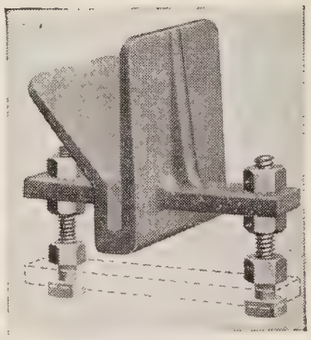
INTER-MEDIATE SECTION
CODE: NATURFLUG



BASE
CODE: NATUR-MYTHE



TROUGH SUPPORT
CODE: NATURSTOLZ



TROUGH SUPPORT WITH 6-INCH BEARING SURFACE
CODE: NATURVOLK

Size of Pipe.....Inches		2			2 & 2½	2½	3
Size of Pipe.....Millimeters		50			50 & 64	64	76
Centers.....Inches		3¼	4	4⅝	4⅝	4⅝	6
Intermediate Section Each	Number pipes high. 2						
	3			2.25			
	4	2.40	2.50	2.50	3.00	3.00	3.25
	5		3.30				
	6	3.50	3.75	3.75			5.00
	7		5.00				
	8	5.00					
Top Section Each	No. pipes high. 2						
	3			2.25			
	4		2.50	2.50	3.00	3.00	3.25
	5			3.50			
	6			3.75		4.70	5.00
Base, 9 inches high.....Each				2.50			
Base, 12 inches high.....Each							3.25
Base, 15 inches high.....Each				3.00			
Header Support.....Each				2.00			2.50
Trough Support, 2 Ins. wide..Each				1.00			
Trough Support, 6 Ins. wide..Each				1.70			

Prices include all necessary bolts.

The 9 and 15-inch bases are used on both atmospheric and double pipe condensers; the 12-inch base on brine coolers.

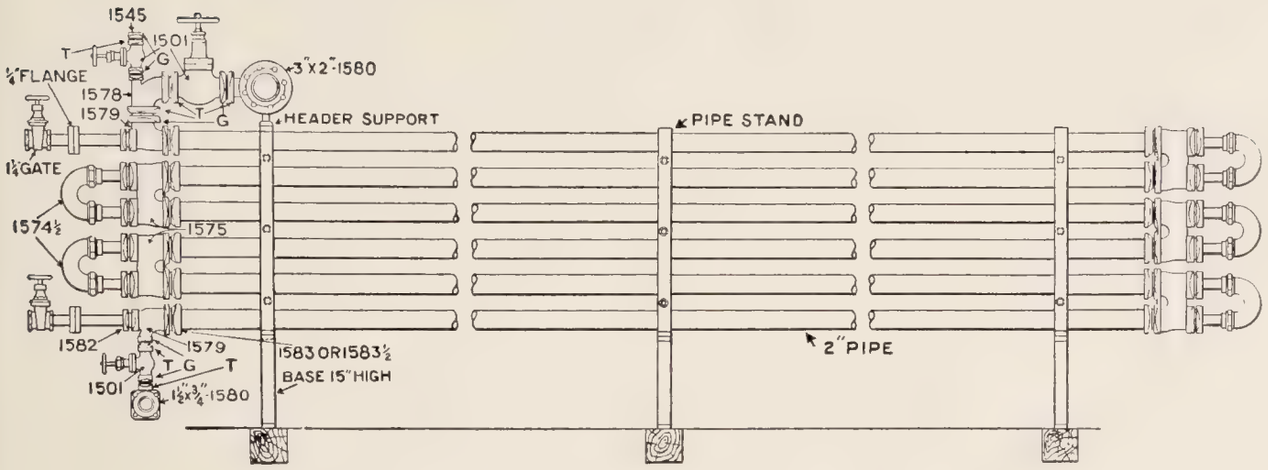
A complete stand consists of a base, intermediate sections and a top section, but an intermediate section may be used at the top if desired.

We can also furnish larger sizes. Price on application.

Intermediate Sections can be furnished in Malleable Iron at a special price.

DOUBLE PIPE CONDENSER

2-INCH OUTSIDE PIPE, 1¼-INCH INSIDE PIPE

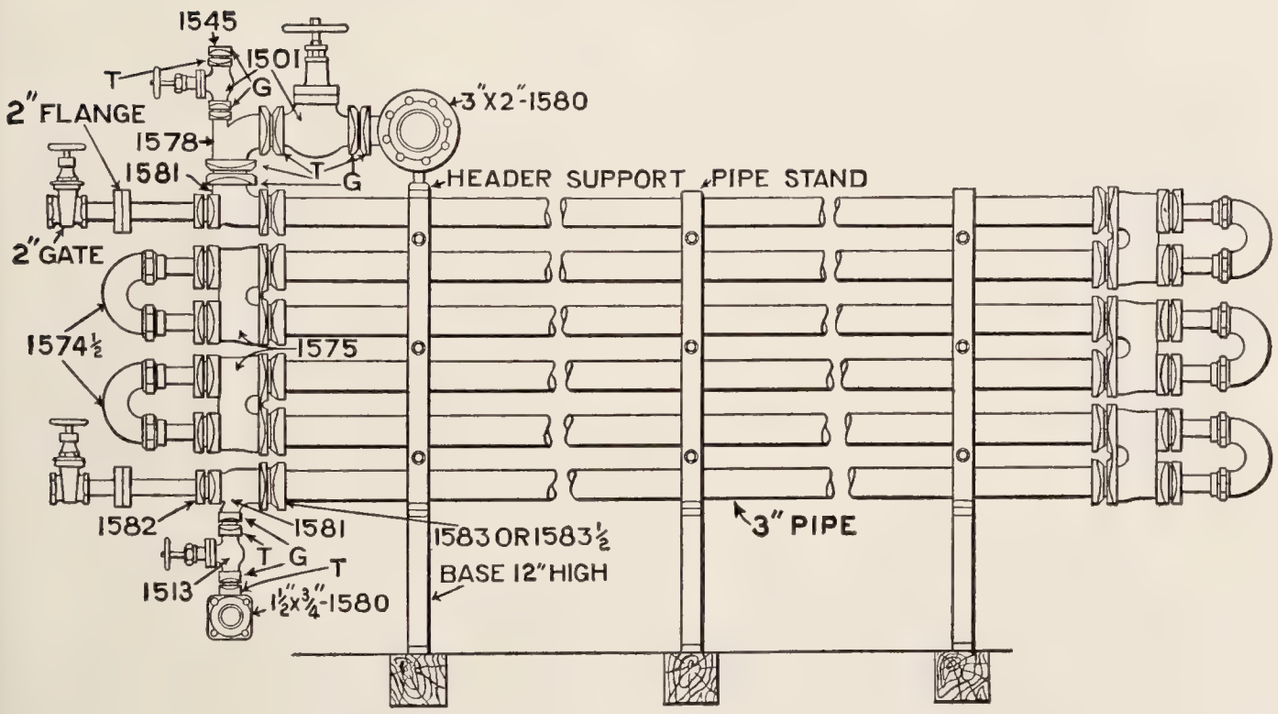


LETTERS T OR G INDICATE TONGUE OR GROOVE

1501—Globe Valves
1545—Companion Flange
1574½—Union Water Bend
1575—Ammonia Return Bend
1578—Back Outlet Elbow
1579—Ammonia Tee
1580—Header Tees
1582—Special Oval Gland
1583—Special Square Boyle Flange
1583½—Special Square Groove Flange

DOUBLE PIPE BRINE COOLER OR HEAT EXCHANGER

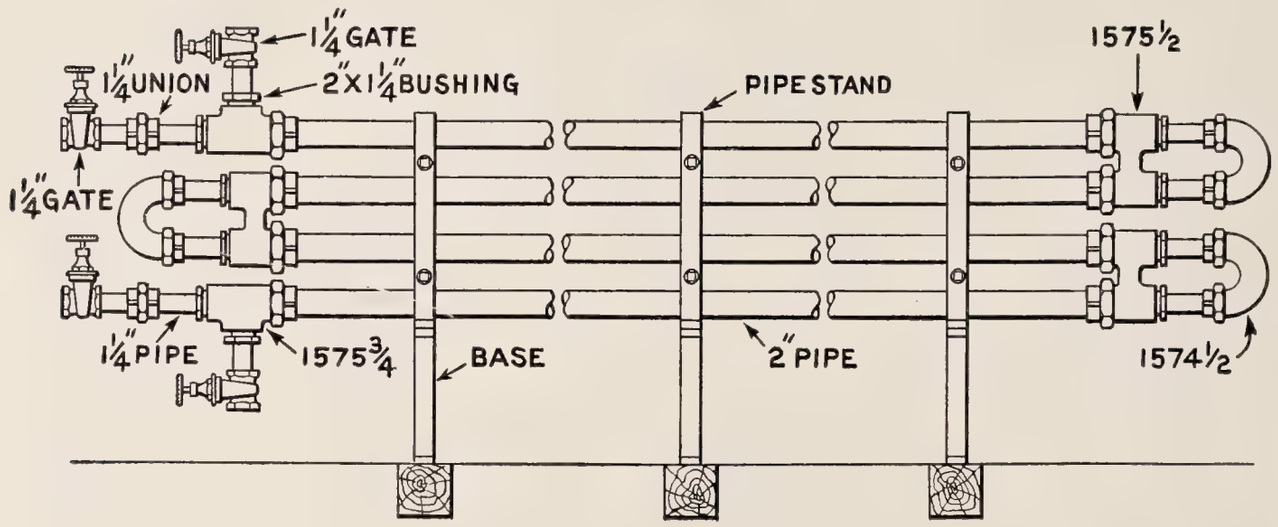
3-INCH OUTSIDE PIPE, 2-INCH INSIDE PIPE



LETTERS T OR G INDICATE TONGUE OR GROOVE

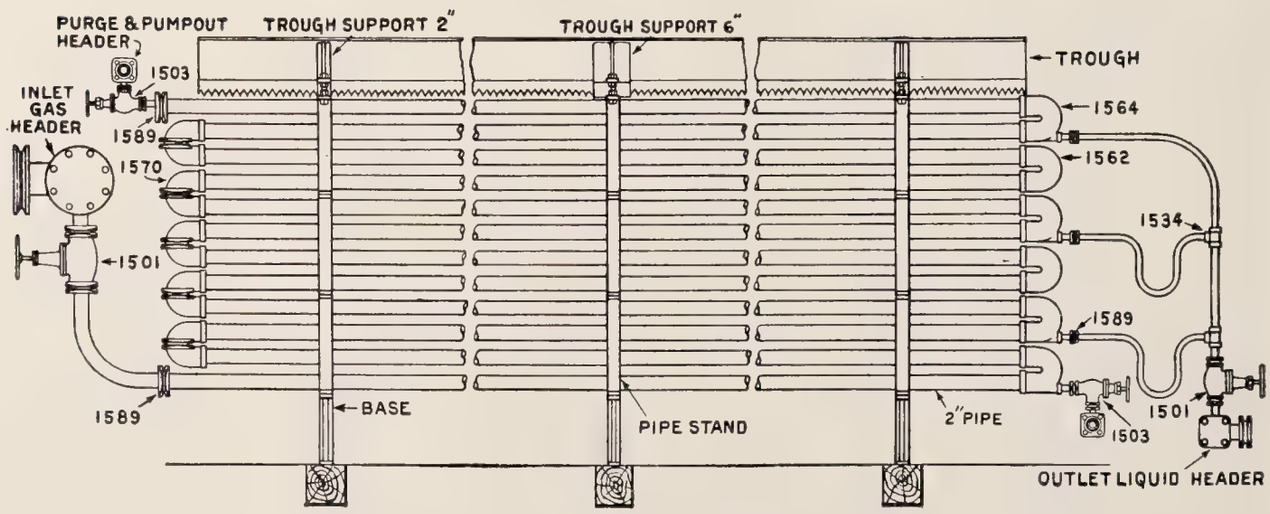
1501—Globe Valve
1513—Expansion Valve
1545—Companion Flange
1574½—Union Brine Bend
1575—Ammonia Return Bend
1578—Back Outlet Elbow
1580—Header Tee
1581—Ammonia Tee
1582—Special Oval Gland
1583—Special Square Boyle Flange
1583½—Special Square Groove Flange.

DOUBLE PIPE WATER COOLER



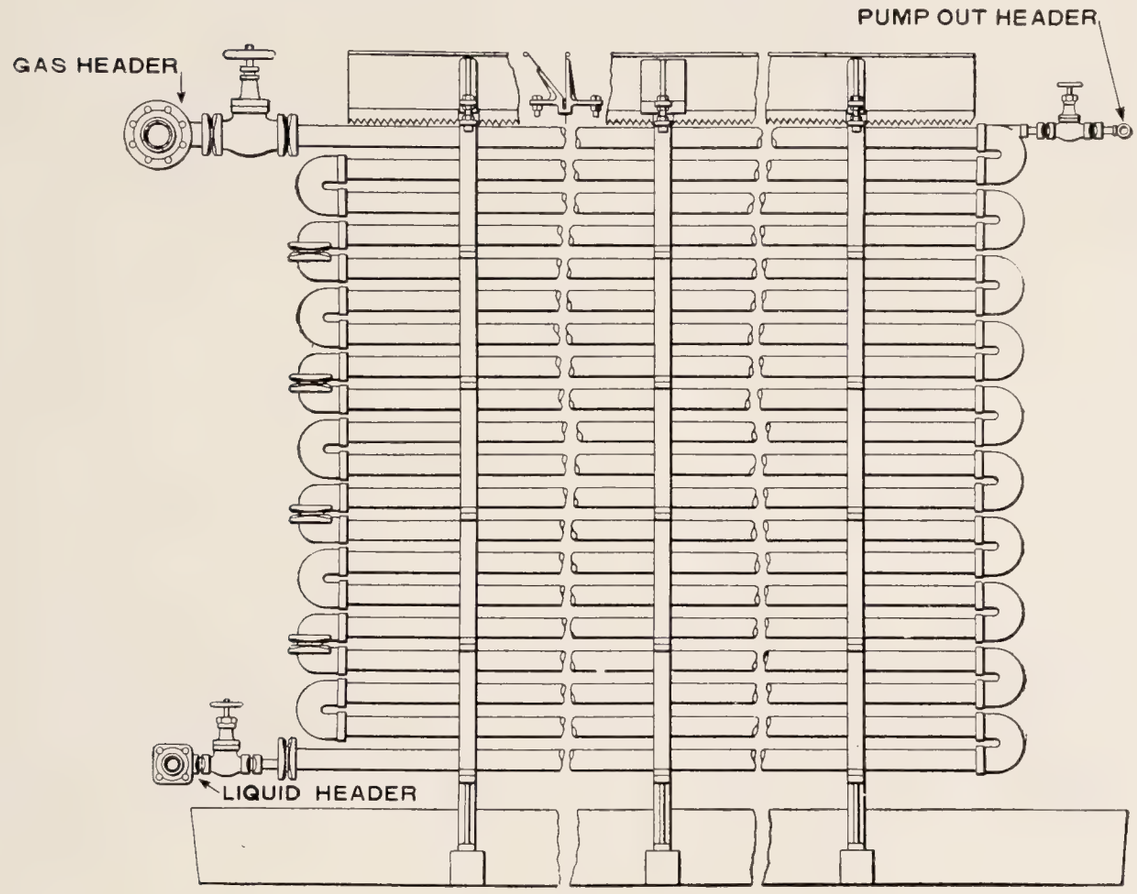
ATMOSPHERIC AMMONIA CONDENSER

BLEEDER TYPE



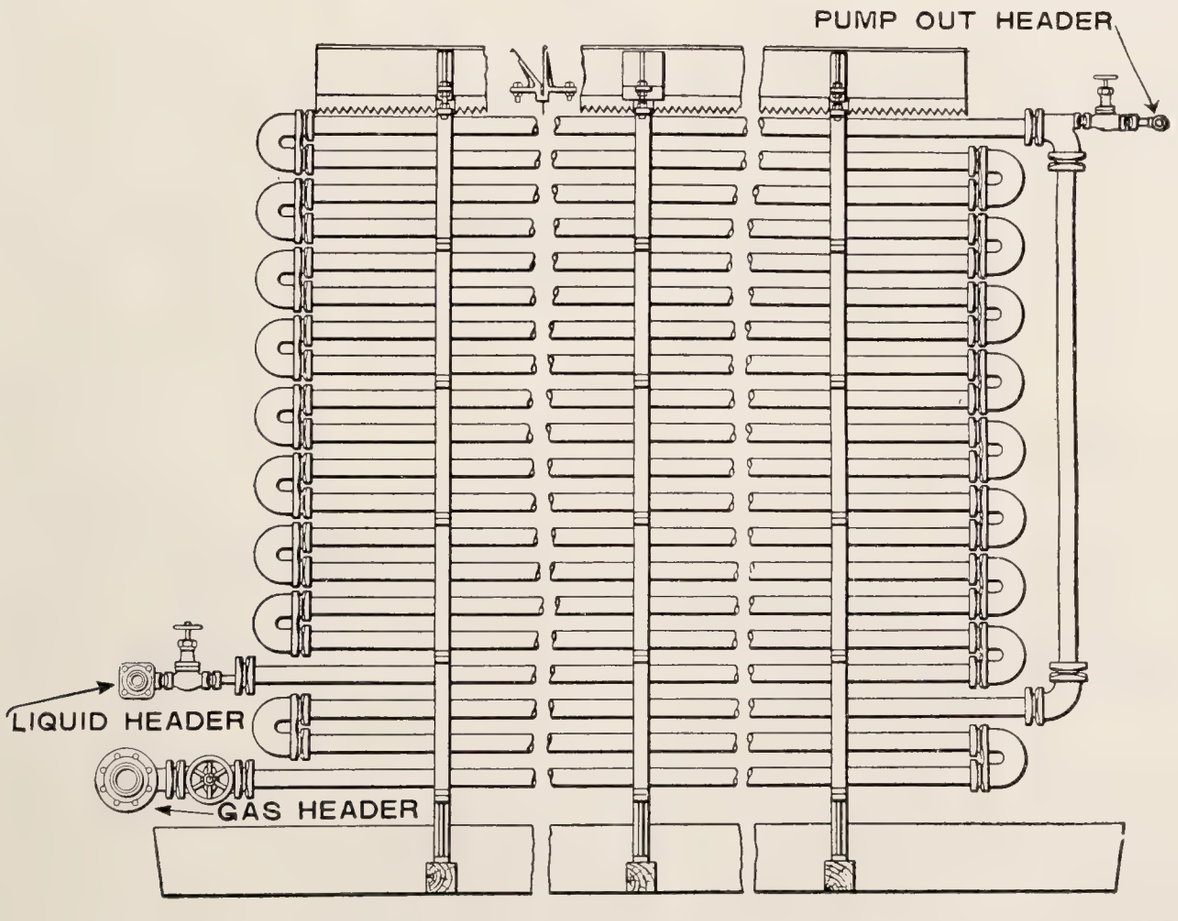
ATMOSPHERIC CONDENSER

SCREWED OR FLANGED RETURN BENDS



ATMOSPHERIC CONDENSER

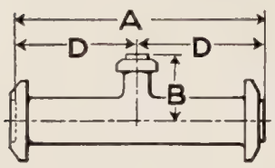
THREE PIPES PRELIMINARY SCREWED OR FLANGED RETURN BENDS

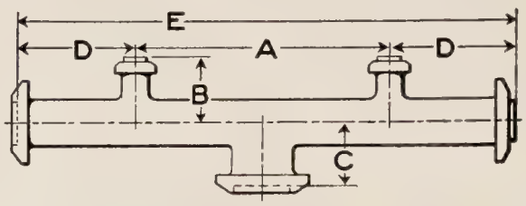


COMPLETE INFORMATION RELATIVE TO ANY OF THE CONDENSERS SHOWN WILL BE FURNISHED ON APPLICATION

FERROSTEEL AND WELDED

HEADERS FOR CONDENSERS, BRINE COOLERS, ETC.





No. 1580—FERROSTEEL

CODE: NAUCLERUS

LIST PRICES AND DIMENSIONS

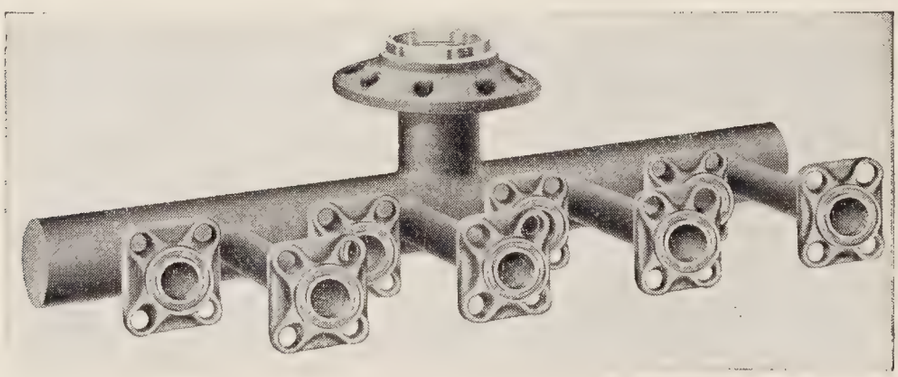
SIZE INCHES			One Branch A—Inches					Two Branch A—Inches					B Branch Outlet	C Back Outlet
Run		Branch	15	18	20	24	30	15	18	20	24	30		
1½	x	¾	4.75	5.50	6.00	6.60	8.00	8.50	9.00	10.00	11.00		4⅜" Tongue	4⅞" Tongue
2	x	¾	5.25	5.75	6.15	6.80	8.50	9.00	9.50	10.50	11.50		4⅞" Tongue	4⅞" Tongue
3	x	2	10.00	11.50	12.25	12.50	14.00	16.25	17.50	21.00	24.00	30.50	6 13/16" Tongue	6⅞" Groove
4	x	2	14.50	15.00	16.00	19.50	22.00	23.00	24.50	26.00	27.75	37.00	7 11/16" Tongue	7¾" Groove

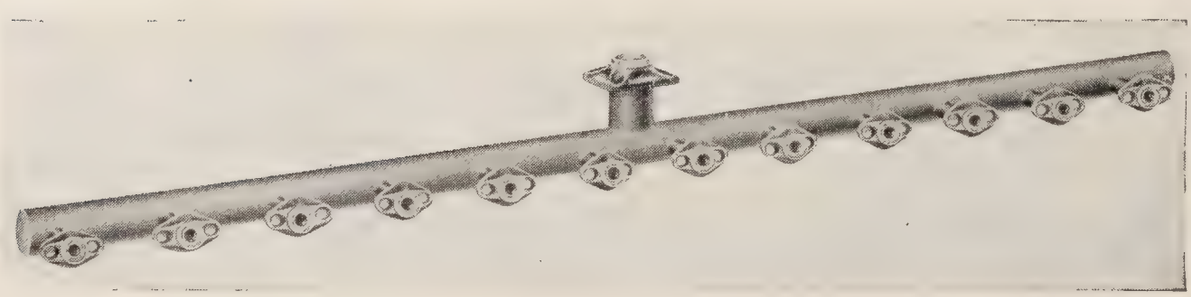
SIZE INCHES			Two Branch—Back Outlet						Three Branch A—Inches			B Branch Outlet	C Back Outlet
Run		Branch	Size Back Out't	15	18	20	24	30	15	18	20		
1½	x	¾	2	9.50	11.00	12.00	13.50		13.00			4⅜" Tongue	4⅞" Tongue
2	x	¾	2	11 50	12.50	14.00	15.50		14.50			4⅞" Tongue	4⅞" Tongue
3	x	2	4	20.00	22.50	25.00	33.00	46.00	24.50	31.00	35.00	6 13/16" Tongue	6⅞" Groove
4	x	2	5	37.00	39.00	41.00	47.00	51.00	30.00	41.50	47.00	7 11/16" Tongue	7¾" Groove

The run in a'l cases will be Tongue and Groove, and the Branch Outlet B and Back Outlet C, as indicated in the above table.

Dimension D is one-half dimension A. Dimension E is twice dimension A.

WELDED AND ASSEMBLED HEADERS



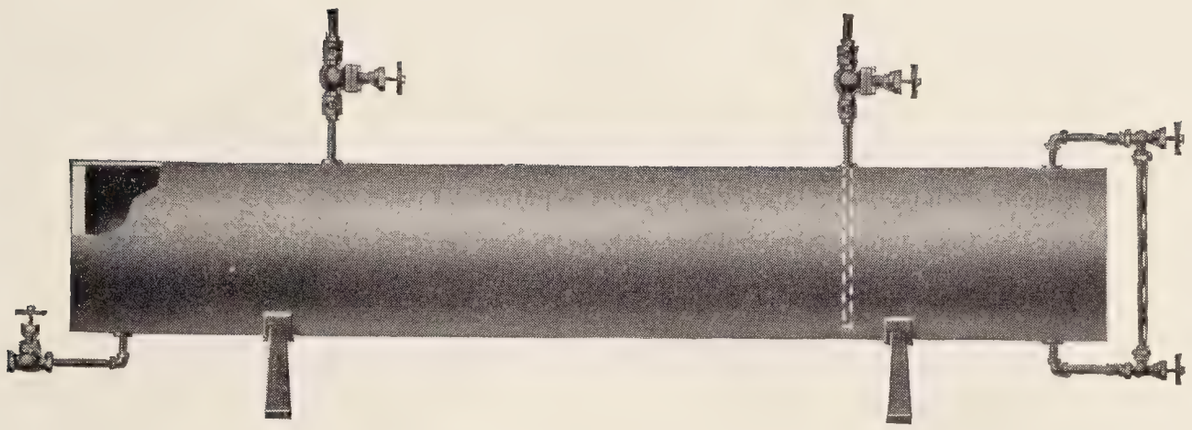


We are prepared to furnish Headers for all purposes made of Ferrosteel, or assembled from pipe and fittings, or constructed of any size or weight wrought steel pipe with hammer welded heads and welded nozzles. All welded Headers are annealed and all Headers for ammonia service regardless of construction are tested under water to 300 pounds air pressure.

Inqu'ries and orders should be accompanied by a sketch showing all necessary dimensions. In addition we should be furnished with information relative to the weight of the pipe desired and the method of making-on the flanges; i. e., litharge and glycerine, soldered, or sweated and soldered.

Assembled or Welded Headers. Prices on Application.

AMMONIA RECEIVERS



CODE: NAUSCOPO

Our receivers are made of either Standard or Extra Heavy Lap Welded Steel Pipe with Hammer Welded Heads. After welding they are annealed and tested under water to 300 pounds of air pressure. They are usually furnished complete with stands, inlet, outlet and drain connections and safety ammonia gauges.

We can also furnish these receivers tapped for the above connections only but without the trimmings.

Unless otherwise specified, connections to the shell ½-inch and smaller will not be bossed as shown.

The Standard Receiver is horizontal; however we are prepared to furnish vertical receivers.

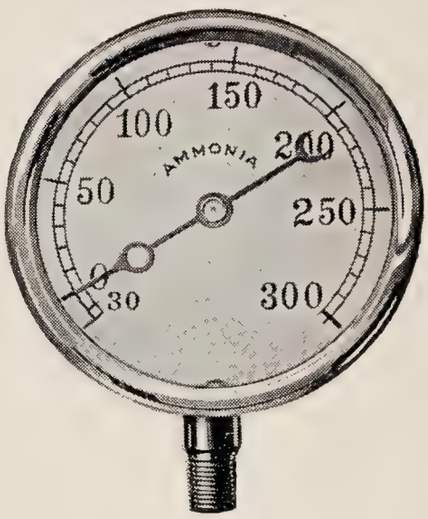
Inquiries and orders should be accompanied by a sketch specifying diameter and length of the receiver, also sizes and locations of the connections desired.

Prices on application.

AMMONIA GAUGES

Size Dial.....Inches	8½	6¾	6
No. 1587, Iron Case, Nickel Plated Ring .....Each	45.75	40.60	35.50

Size Dial.....Inches	5½	5	4½
No. 1587, Iron Case, Nickel Plated Ring .....Each	30.50	30.50	25.50



No. 1587
CODE: NAUSEABUNT

No Cocks are furnished with these Gauges.
These Gauges are carried in stock in the following graduations:
Low Pressure—150 pounds pressure, 30 inches vacuum.
High Pressure—300 pounds pressure, 30 inches vacuum.

ALL-IRON SAFETY GAUGES

WITH

AUTOMATIC GAUGE VALVES

FOR AMMONIA, AIR, GAS, CHEMICALS, Etc.

WORKING PRESSURES UP TO 300 POUNDS

The construction of these Gauge Valves is such, that should the glass tube be broken, the Valves instantly and automatically close, allowing the installation of a new glass and preventing loss or danger from escaping ammonia.

No. 1586½
CODE: NAUSEAVERO

PRICE, COMPLETE
INCLUDING GLASS TUBE AND GUARD
15-INCH CENTERS

½-inch size	12.50
¾-inch size	15.00

Over 15-inch centers and up to 24-inch centers, inclusive, add 25 cents per inch.

EXTRA PARTS FOR GAUGES WITH 15-INCH CENTERS

Size.....Inches	½	¾
Guard.....Each	4.50	4.50
Glass.....Each	.20	.25
Valve.....Each	5.00	6.50
Gauge Glass Washers.....Price, per doz. net	1.12	1.12

The glass in these Gauges is 9/16-inch outside diameter.

ALL-IRON

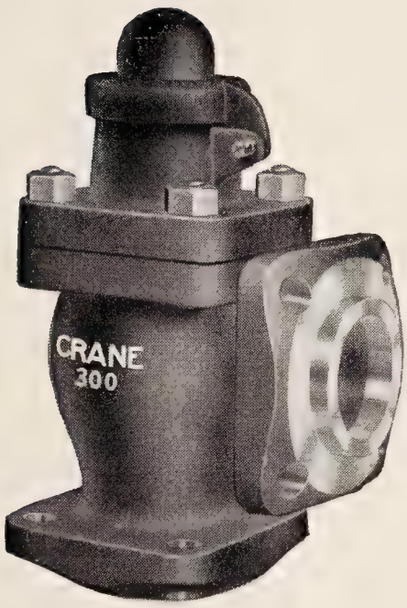
RELIEF VALVES

(FERROSTEEL)

FOR AMMONIA, AIR, GAS, CHEMICALS AND OTHER SERVICES WHERE ALL-IRON CONSTRUCTION IS DESIRABLE

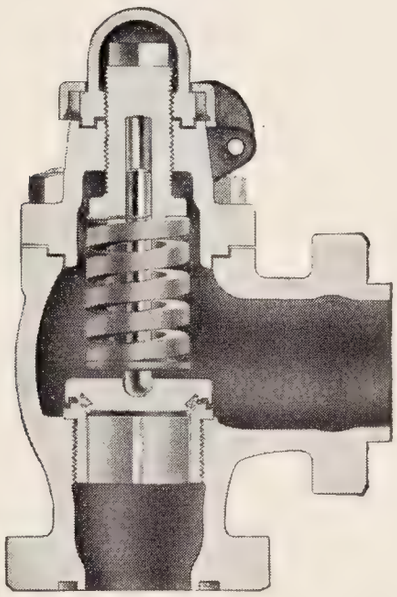
FOR WORKING PRESSURES UP TO 300 POUNDS

TONGUE AND GROOVE ENDS



No. 1596, FLANGED
CODE: NAUSITHOUS

No. 1596½, SCREWED
CODE: NAUTISCHER



SECTION

These valves may be set to blow off at any point up to 300 pounds.
The cap may be sealed or locked to prevent tampering.

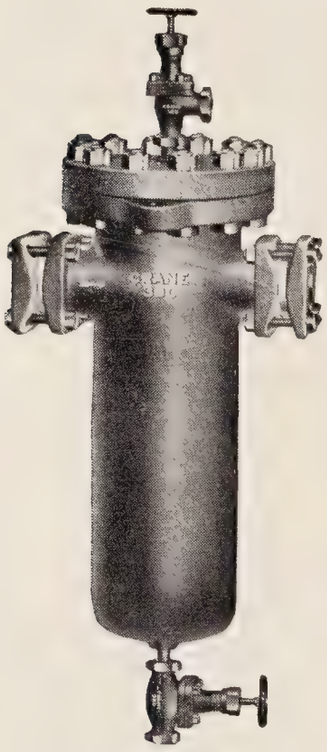
Size.....Inches	½	¾	1	1¼	1½	2	2½	3
Size.....Millimeters	13	19	25	32	38	50	64	76
No. 1596, without Companion Flanges, Bolts and Gaskets .....Each	15.50	16.50	18.30	20.25	24.75	33.00	49.80	60.00
No. 1596, with Companion Flanges, Bolts and Gaskets .....Each	16.45	17.70	19.80	22.50	27.00	36.00	54.00	67.50
No. 1596½, Screwed Ends. Each	15.50	16.50						

Relief Valves can also be furnished Globe pattern at the same price as the Angle.

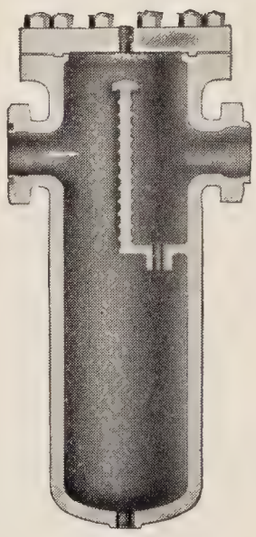
On Ammonia service we will furnish regularly valves, set to relieve at 250 pounds pressure and Flanged Valves will have Companion Flanges, Gaskets and Bolts unless otherwise specified.

For Flange dimensions see page 674.

ALL-IRON
OIL SEPARATORS
(FERROSTEEL)
FOR AMMONIA, AIR, OR GAS
FOR WORKING PRESSURES UP TO 300 POUNDS
TONGUE AND GROOVE



No. 1594½
CODE: NAVALHINHO



SECTION

Style of Flanges	Oval	Square				
Size, Inches	¾	1	1¼	1½	2	2½
Size, Millimeters	19	25	32	38	50	64
With Companion Flanges, Bolts and Gaskets, Drain and Purge Valves, Each	45.00	65.00	65.00	100.00	100.00	100.00
With Companion Flanges, Bolts and Gaskets, but without Drain and Purge Valves, Each	34.00	54.00	54.00	88.50	88.50	88.50
Style of Flanges	Round					
Size, Inches	3	3½	4	5	6	
Size, Millimeters	76	90	100	125	150	
With Companion Flanges, Bolts and Gaskets, Drain and Purge Valves, Each	140.00	140.00	140.00	260.00	260.00	
With Companion Flanges, Bolts and Gaskets, but without Drain and Purge Valves, Each	128.00	128.00	128.00	247.00	247.00	

Sizes above 6-inch made to order at a special price.

These separators have a large baffle surface and such internal area that the velocity of flow will be diminished, rather than increased, when passing through the separator.

With this type of Separator the Baffle Plates cannot become loose.

Another feature of Crane Separators is the provision of means for examining and cleaning the interior. This is an extremely important point, as quick inspection is sometimes necessary.

For Flange dimensions, see page 674.
For dimensions, see page 675.

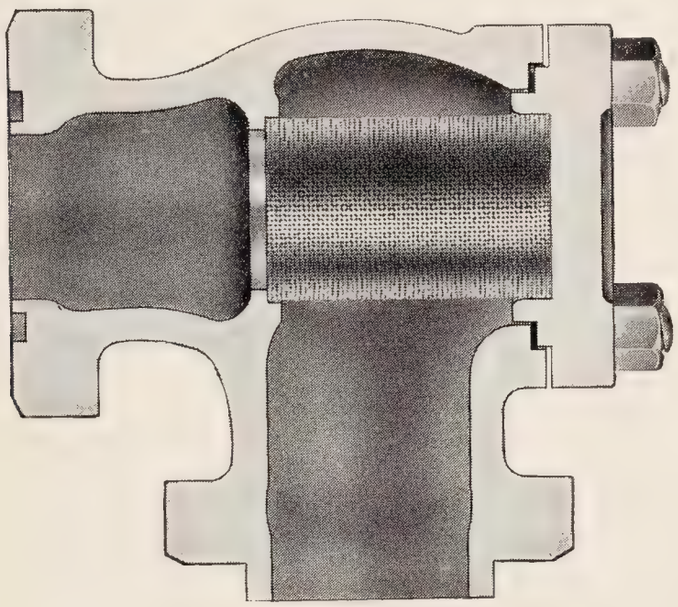
ALL-IRON

SEDIMENT SEPARATORS

(FERROSTEEL WITH STEEL PERFORATED SCREEN)

FOR AMMONIA, AIR, GAS, CHEMICALS AND OTHER SERVICES WHERE ALL-IRON CONSTRUCTION IS DESIRABLE

FOR WORKING PRESSURES UP TO 300 POUNDS
TONGUE AND GROOVE ENDS



No. 1595

CODE: NAVAVISSES

WITHOUT COMPANION FLANGES, BOLTS OR GASKETS

Style of Flanges	Oval	Square				
Size....Inches	¾	1	1¼	1½	2	2½
Size....Millimeters	19	25	32	38	50	64
Price....Each	9.00	10.00	14.00	16.25	20.00	25.00
Style of Flanges		Round				
Size....Inches	3	3½	4	5	6	
Size....Millimeters	76	90	100	125	150	
Price....Each	42.00	54.00	68.00	106.00	140.00	

WITH COMPANION FLANGES, BOLTS AND GASKETS

Style of Flanges	Oval	Square				
Size....Inches	¾	1	1¼	1½	2	2½
Size....Millimeters	19	25	32	38	50	64
Price....Each	10.50	11.85	16.75	19.00	23.70	30.50
Style of Flanges		Round				
Size....Inches	3	3½	4	5	6	
Size....Millimeters	76	90	100	125	150	
Price....Each	51.30	65.40	81.30	122.65	162.15	

Smaller and larger sizes made to order. Prices on application.

Unless otherwise specified we will always furnish Traps complete with Companion Flanges, Gaskets and Bolts.

Sediment Traps have the same dimensions as Tongue and Groove Angle Valves and Elbows.

The Steel Perforated Screen may be taken out readily and cleaned.

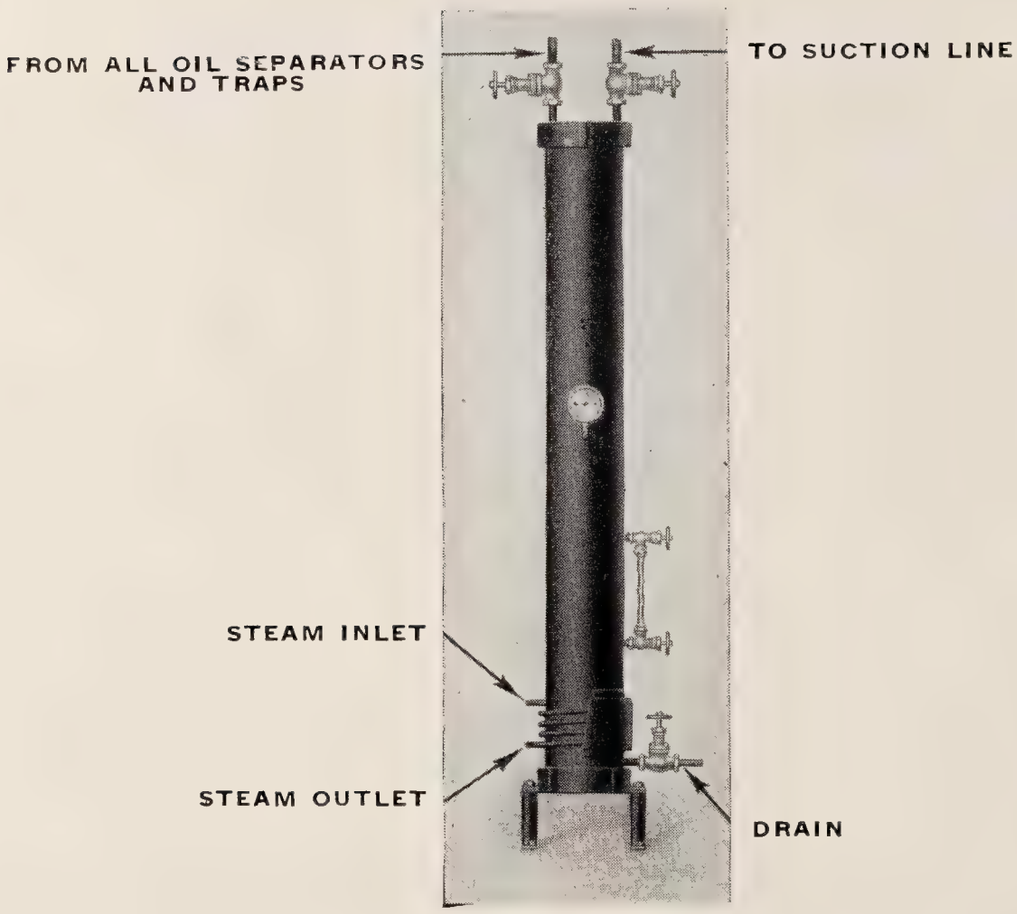
The Screen has .033-inch diameter perforations (324 holes per square inch).

See pages 273 and 274 for other Sediment Separators.

Sediment Separators have same center to face dimensions as No. 1503 Angle Valves. For dimensions, see page 670.

For Flange dimensions, see page 674.

AMMONIA PURIFIER



CODE: NAVELSWIJS

This purifier will remove all oil and other foreign matter from the ammonia.

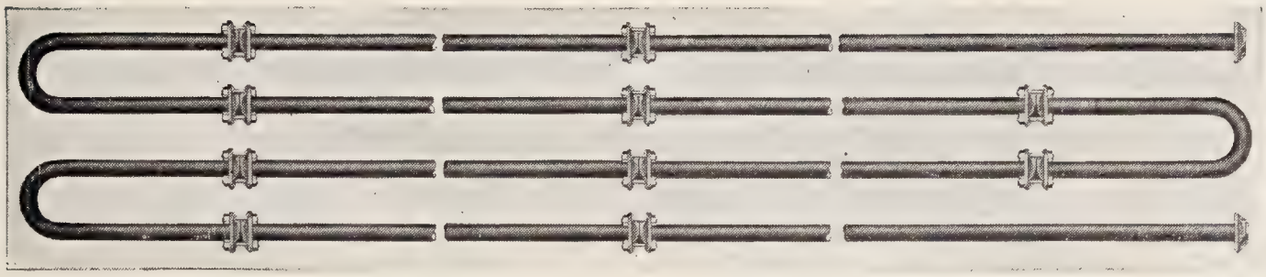
APPLICATION

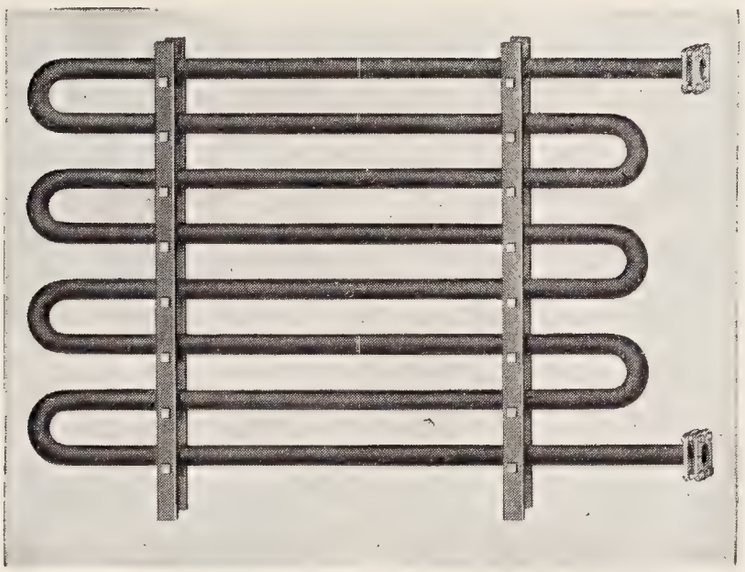
The installation of one of these purifiers should greatly increase the efficiency of any refrigerating machine, and effect a saving in operation.

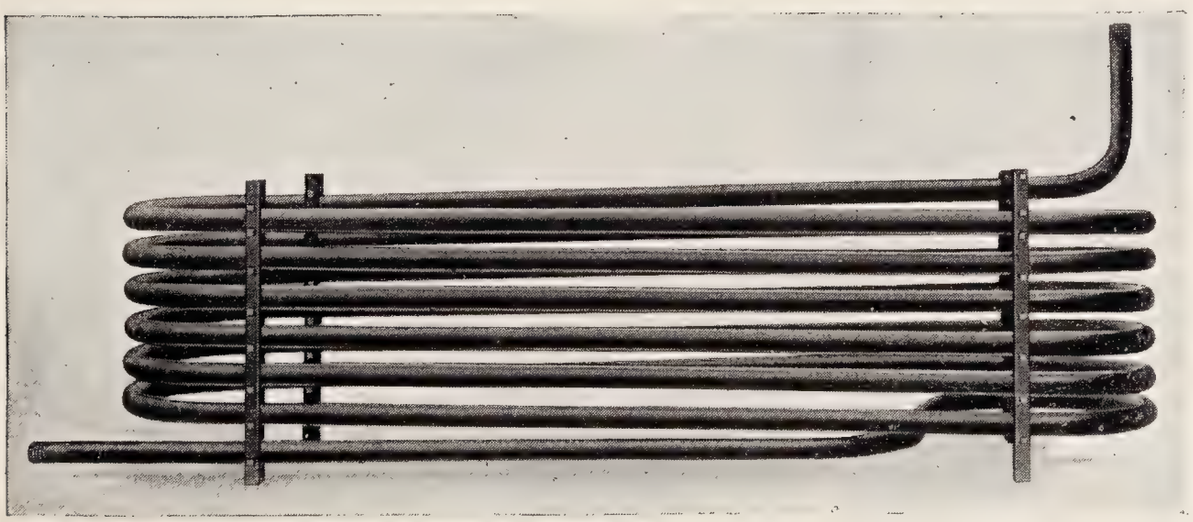
OPERATION

Allow oil and other substances to drain to the purifier until oil shows in the gauge glass, then shut off the supply valve from all traps, etc., but allow the valve to suction line to remain open. Turn steam into the coil and keep on for about twenty-four hours, then close valve to the suction line and drain through the drain valve.

PIPING AND COILS FOR ALL PURPOSES







Our facilities insure uniformity in bends and exactness in measurements.

We are prepared to furnish coils made up from pipe and return bends.

We can also furnish coils made by welding lengths of pipe together and bending in any practical shape.

Coils supplied for:

Direct Expansion or Brine Circulating Systems.
Freezing Tanks.
Ice Storage Rooms.
Water Coolers.
Accumulators.
Condensers.
Brine Coolers.
Steam and Water Piping.

Request for prices should be accompanied by a sketch giving complete information.

COMPARISON OF WROUGHT PIPE WITH NEAREST SIZES OF "SHELBY" SEAMLESS STEEL TUBING

STANDARD

Nominal Size Inside Diameter of Standard Wrought Pipe		Nominal Weight Per Foot	Nominal Thickness of Wall	Nearest Fractional Size of Seamless	
Size	O. D.			O. D.	Thickness
1/8	.405	.244	.068	13/32	16 Ga.
1/4	.540	.424	.088	17/32	14 Ga.
3/8	.675	.567	.091	21/32	13 Ga.
1/2	.840	.850	.109	27/32	12 Ga.
3/4	1.050	1.130	.113	1 1/16	12 Ga.
1	1.315	1.678	.133	1 5/16	10 Ga.
1 1/4	1.660	2.272	.140	1 5/8	9 Ga.
1 1/2	1.900	2.717	.145	1 7/8	9 Ga.
2	2.375	3.652	.154	2 3/8	5/32
2 1/2	2.875	5.793	.203	2 7/8	6 Ga.
3	3.500	7.575	.216	3 1/2	7/32
3 1/2	4.000	9.109	.226	4	4 Ga.
4	4.500	10.790	.237	4 1/2	4 Ga.
4 1/2	5.000	12.538	.247	5	1/4
5	5.563	14.617	.258	5 5/8	9/32
6	6.625	18.974	.280	6 5/8	9/32

EXTRA STRONG

Nominal Size Inside Diameter of Extra Strong Pipe		Normal Weight Per Foot	Nominal Thickness of Wall	Nearest Fractional Size of Seamless	
Size	O. D.			O. D.	Thickness
1/8	.405	.314	.095	13/32	13 Ga.
1/4	.540	.535	.119	17/32	11 Ga.
3/8	.675	.738	.126	11/16	1/8
1/2	.840	1.087	.147	27/32	9 Ga.
3/4	1.050	1.473	.154	1 1/16	5/32
1	1.315	2.171	.179	1 5/16	7 Ga.
1 1/4	1.660	2.996	.191	1 11/16	3/16
1 1/2	1.900	3.631	.200	1 7/8	6 Ga.
2	2.375	5.022	.218	2 3/8	7/32
2 1/2	2.875	7.661	.276	2 7/8	9/32
3	3.500	10.252	.300	3 1/2	1
3 1/2	4.000	12.505	.318	4	5/16
4	4.500	14.983	.337	4 1/2	11/32
4 1/2	5.000	17.611	.355	5	11/32
5	5.563	20.778	.375	5 9/16	3/8
6	6.625	28.573	.432	6 5/8	7/16

DOUBLE EXTRA STRONG

Nominal Size Inside Diameter of Double Extra Strong Pipe		Nominal Weight Per Foot	Nominal Thickness of Wall	Nearest Fractional Size of Seamless	
Size	O. D.			O. D.	Thickness
1/2	.840	1.714	.294	2 1/32	19/64
3/4	1.050	2.440	.308	1 1/16	5/16
1	1.315	3.659	.358	1 5/16	23/64
1 1/4	1.660	5.214	.382	1 11/16	25/64
1 1/2	1.900	6.408	.400	1 7/8	13/32
2	2.375	9.029	.436	2 3/8	7/16
2 1/2	2.875	13.695	.552	2 7/8	9/16
3	3.500	18.583	.600	3 1/2	19/32
3 1/2	4.000	22.850	.636	4	5/8
4	4.500	27.541	.674	4 1/2	11/16
4 1/2	5.000	32.530	.710	5	23/32
5	5.563	38.552	.750	5 5/16	3/4
6	6.625	53.160	.864	6 5/8	7/8

INFORMATION ON LARGER SIZES WILL BE FURNISHED ON REQUEST

MALLEABLE IRON PIPE VISES

SHUT

OPEN

CODE: NAVICARONO

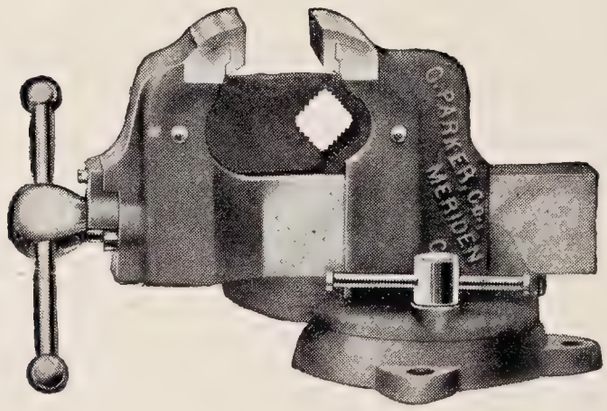
Number	1	2
Holds Pipe from	⅛ to 2 inch	⅛ to 3 inch
Weight ..... Pounds	16	30
Price, Complete ..... Each	10.00	14.00
Extra Jaws, Per Set of Three ..... Net	.60	.90
Extra Yoke ..... Net	.60	.85
Extra Screw ..... Net	.25	.40
Extra Slide ..... Net	.10	.15
Extra Handle ..... Net	.15	.20
Extra Bottom Piece ..... Net	.60	.75
Extra Hook ..... Net	.10	.15

Vises to handle a larger range of sizes can be furnished. Prices on application.

The Malleable Iron Pipe Vise is preferable to the Cast Iron in every respect, being much lighter, more durable and cheaper. Has renewable jaws, and is constructed for heavy work, great care having been taken in manufacturing the various parts, and the strength put where it is most required.

PARKER'S

COMBINATION PIPE VISES

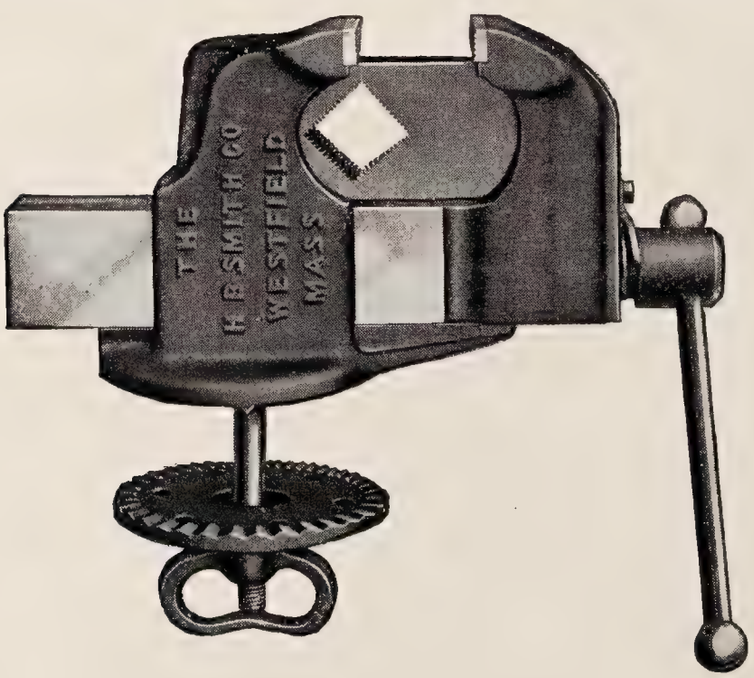


CODE: NAVIGANDUM

Number	87	88	289½
Holds Pipe from ... Inches	⅛ to 2	⅛ to 3	6 In. and Under
Price ... Each	16.00	22.00	45.00
Weight, pounds ... Each	47	71	185

SMITH'S

COMBINATION PIPE VISES



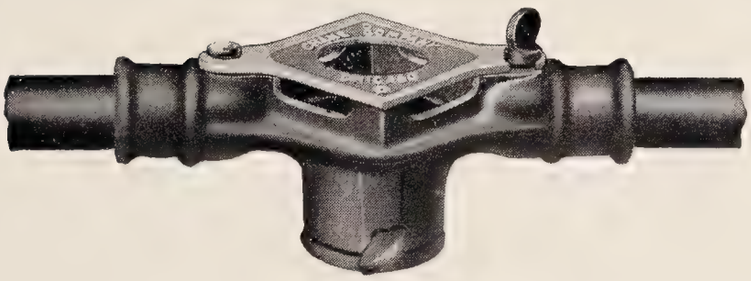
CODE: NAVIGASSEM

Number	1	2	3
Holds Pipe from ... Inches	⅛ to 2	¼ to 3	¼ to 4
Price ... Each	16.00	22.00	32.00
Weight, pounds ... Each	47	70	100

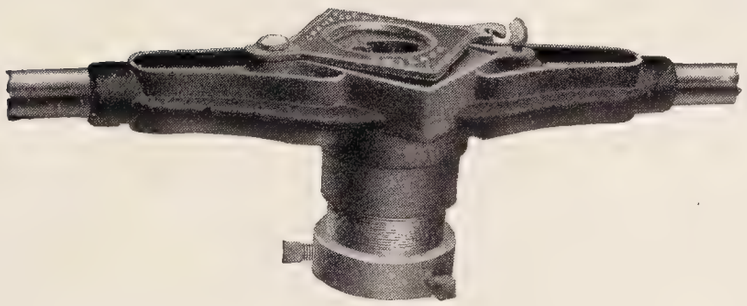
STOCKS AND DIES

MALLEABLE STOCK

CODE: NAVIGAVERO

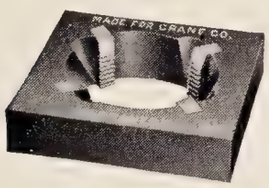


B. C. DD AND D STOCKS



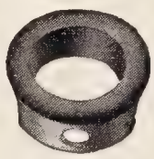
E AND H STOCKS, WITH LEADER SCREW

Size	B	C	DD	D	E	H
Dies Fur'd with each Stock..Ins.	⅛to½	¼to1	¾to1¼	1to1½	1¼to2	2½ & 3
Dimensions of Dies.....Inches	2x½	2½x¾	3x¾	3x¾	4x⅞	5x1¼
Stock with Dies Comp.....Each	13.60	18.75	16.50	16.50	22.15	56.70
Stock without Dies.....Each	2.60	3.75	4.50	4.50	7.15	26.70



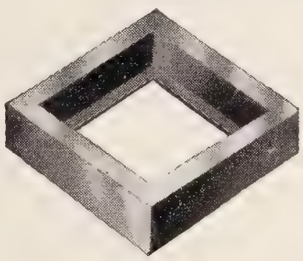
DIE

CODE: NAVIGUANTE



BUSHING

CODE: NAZAREUS



DIE FRAME

CODE: NEBELNACHT

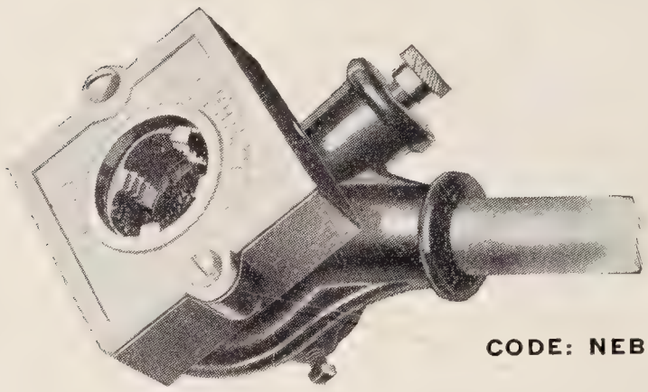
Size	B	C	DD	D	E	H
Pipe Sizes	⅛to½	⅛to1	⅛to1½	⅛to1½	½to2	2½ and 3
Ex. Dies, R. or L. Hand Each	2.75	3.00	4.00	4.00	5.00	15.00
Extra Bushings.....Each	.20	.25	.35	.35	.45	1.10

EXTRA PARTS

Size	B	C	DD	D	E	H
Caps, Net.....Each	.15	.20	.30	.30	.30	
Thumb Screws for Cap or Bushing, Net.....Each	.10	.10	.10	.10	.10	
Mach. Screws for Cap, Net..Each	.05	.05	.05	.05	.05	
Handles, Net.....Per Set	.50	.70	.80	.80	1.00	
Die Frames, Net.....Each			.12	.12	.20	.60
Leader Screws, Net.....Each					.75	
Th'b Screws for Leader, Net...Each					.10	

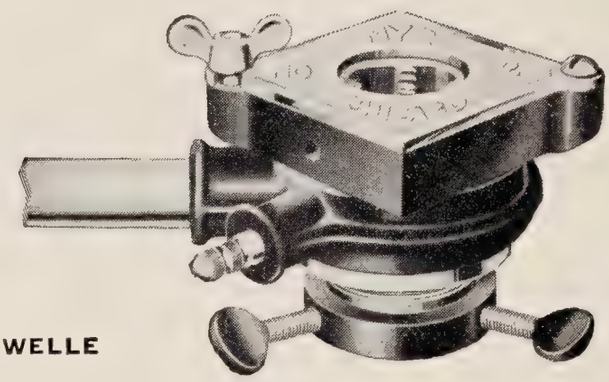
The above Stocks and Dies are made so that they are interchangeable with those of eastern manufacture, known to the trade as No. 0, No. 1, No 1½, No. 1¾, and No. 2 respectively.

SOLID RATCHET DIE STOCKS



Nos. 1 AND 1½

CODE: NEBELWELLE



No. 2

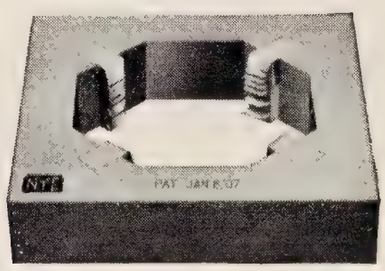
PRICE LIST AND DIMENSIONS

Number	1	1½	*2
Die Range for Each Stock....Inches	⅛ to 1	⅛ to 1½	½ to 2
Die Range for Each Stock....Millimeters	3 to 25	3 to 38	13 to 50
Dimensions of Dies....Inches	2½x¾	3x¾	4x⅞
Stocks Only, Including Bushings but Without Dies..	8.50	10.00	15.00
Dies Only, Per Set	18.00	32.00	30.00
Stocks and Dies Complete	25.50	42.00	42.50

*Equipped with leader screw.

Working parts are completely enclosed to protect them from dirt and sand, and the compactness of this stock permits its use in very close quarters. A complete set of bushings is furnished with each stock, but any ordinary bushing will fit. By reversing the die in the die-box a thread can be cut on a pipe projecting one or two inches from the wall.

SKIP TOOTH DIE

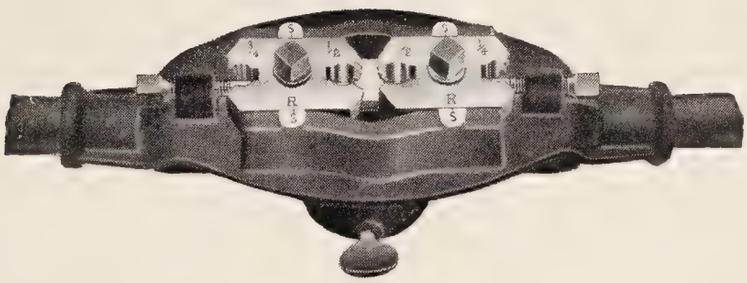


CODE: NEBENBAREN

Size....Inches	⅛	¼	⅜	½	¾	1
Size....Millimeters	3	6	10	13	19	25
Block 2x2x½ inches....Each	2.75	2.75	2.75	2.75		
Block 2½x2½x¾ inches....Each	3.00	3.00	3.00	3.00	3.00	3.00
Block 3x3x¾ inches....Each	4.00	4.00	4.00	4.00	4.00	4.00
Block 4x4x⅞ inches....Each				5.00	5.00	5.00

Size....Inches	1¼	1½	2	2½	3
Size....Millimeters	32	38	50	64	76
Block 3x3x¾ inches....Each	4.00	4.00			
Block 4x4x⅞ inches....Each	5.00	5.00	5.00		
Block 5x5x1¼ inches....Each				15.00	15.00

ARMSTRONG ADJUSTABLE DIE STOCKS



CODE: NEBENHALM

Size Number	Threads Pipe	Price List				
		Stock and Dies Compl.	Stock Only	Extra Dies, Per Set	Extra Bushings, Each	Extra Wrenches Each
No. 1, 4 Sets of Dies (8 pcs.) Sing. End	⅛ to ½	9.00	3.25	1.60	.30	.20
No. 2, 5 Sets of Dies (10pcs.) Sing. End	¼ to 1	12.00	4.00	2.00	.40	.25
No. 2½, 2 Sets of Dies (4pcs.) Doub. End	½ to 1¼	14.00	5.25	3.50	.60	.25
No. 3, 3 Sets of Dies (6 pcs.) Sing. End	1¼ to 2	18.00	7.00	4.50	.75	.30
No. 6, 1 Set of Dies (2 pcs.) Doub. End	2½ to 3	45.00	25.00	17.00	2.00	.30
No. 7, 2 Sets of Dies (8 pcs.) Doub. End	2½ to 4	75.00	30.00	20.00	3.00	.30

WHEN ORDERS ARE SO SPECIFIED

The No. 2 Complete Stock will be furnished, in addition, with ⅛-inch Die and Bushing by adding to the above List Price $2.40.

The No. 2½ Complete Stock will be furnished, in addition, with ¼ and ⅜-inch Single End Dies and Bushings by adding to the above List Price $2.50 for each Die and 60 Cents for each Bushing, or $6.20 for the two pipe sizes.

The No. 3 Complete Stock will be furnished, in addition, with ¾ and 1-inch Dies and Bushings by adding $10.50 to the above List Price.

Prices for Extra Dies in all sizes are per set of two pieces. Nos. 1, 2 and 3 Stocks have Single End Dies, requiring one set of two pieces to thread one size of pipe. No. 2½ and No. 6 Stocks have Double End Dies in which two pieces also comprise one set, but each set threads two sizes of pipe. When ¼ and ⅜-inch Dies are added to No. 2½ Stock, Single End Dies will be furnished. In the No. 7 Stock, the price for one set of Dies comprises four pieces, and each set will thread two sizes of pipe, viz., 2½ and 3-inch and 3½ and 4-inch. Nos. 6 and 7 Stocks have four arms.

Left Hand Dies will be furnished at same prices as Right Hand Dies.

BEAVER DIE STOCKS

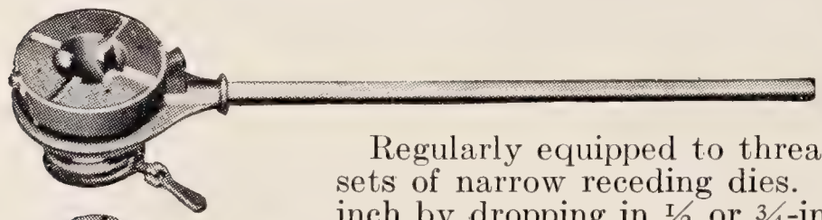
Ratchet and Handle—List 4.00

	1/8″	1/4″	3/8″	1/2″	3/4″	1″
List	3.00	3.00	3.00	3.50	3.50	4.00

No. 3 JR. RATCHET, 1/8 TO 1-INCH
CODE: NEBENSAULE

Consists of ratchet with handle and separate die heads to thread 1/8 to 1-inch. Buy just the die heads you need—add others as required. The only Die Stock like it that includes 1-inch die head. Indispensable for threading in close places.

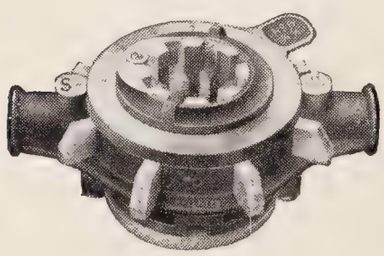
Price complete, 1/8 to 1-inch	24.00
Price complete, 1/4 to 1-inch	21.00
Price complete, 3/8 to 1-inch	18.00



No. 4 BEAVER RATCHET 1 TO 2-INCH
CODE: NEBENSTROM

Regularly equipped to thread 1 to 2-inch using separate sets of narrow receding dies. Range increased to 1/2 to 2-inch by dropping in 1/2 or 3/4-inch die head. Light, simple and durable. Has only three working parts, also made without ratchet (No. 23 Beaver plain), using same 1/2 and 3/4-inch die heads. Dies are interchangeable.

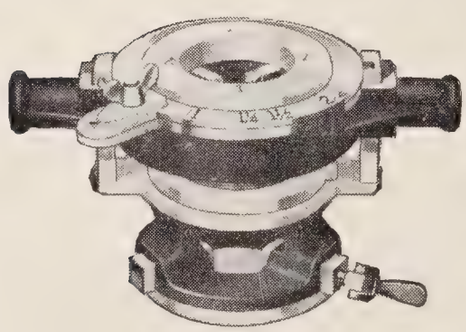
No 4 Ratchet, complete, 1 to 2-inch	30.00
No. 4 Ratchet, complete, 1/2 to 2-inch	41.00
No. 23 Beaver, Plain, 1 to 2-inch	24.00
No. 23 Beaver, Plain, 1/2 to 2-inch	35.00
Dies 1, 1 1/4, 1 1/2 or 2-inch, per single set, each	3.00
Die Heads, 1/2 or 3/4-inch, for No. 23 or No. 4, each	5.50
Dies for Die Heads, per set	3.00



No. 6 BEAVERETTE, 1/4 TO 3/4-INCH
CODE: NEBENWEGEN

The No. 6 "Beaverette" threads all sizes from 1/4 to 3/4-inch, inclusive, without changing dies. The two sets of dies necessary for the two thread pitches are operated by one handle.

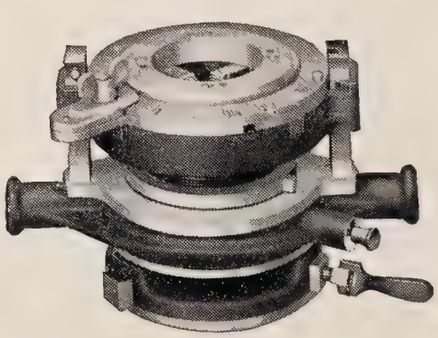
Price, complete		15.00
Extra Dies, 1/8, 1/4-3/8 or 1/2-3/4	Per Set	3.00



No. 25 BEAVER PLAIN
CODE: NEBENWURF

No. 26 BEAVER RATCHET
CODE: NEBENZWECK

THREADS 1 TO 2-INCH



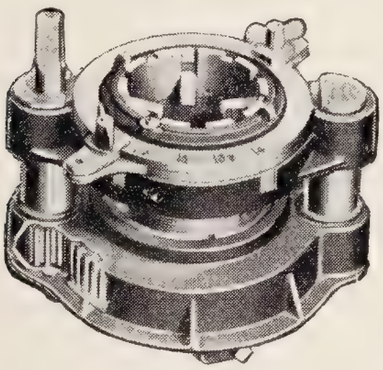
The standard high-grade easy working die stocks. Instantly adjustable. No loose parts. Narrow receding dies, thread two-inch pipe with one hand easily. Universal chuck avoids bushings. Sturdy construction. Built for service. Close nipples easily cut.

Number and Size	25—1″ to 2″	26—1″ to 2″
Price, complete	30.00	35.00
Extra Dies, per set	3.50	3.50

BEAVER DIE STOCKS

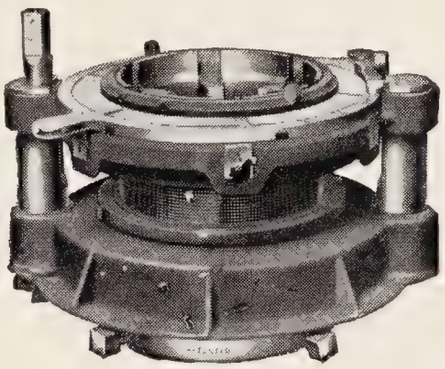
These Die Stocks are fitted with a gear in addition to the Beaver Easy-Working Die by reason of which one man can thread any size pipe within the range of the stock. They are constructed of malleable iron and have bronze bushed, cut steel gears.

They are light, strong and durable and are easily and quickly moved to any place on the job. All are instantly adjustable to thread standard or variations from standard. There are no unnecessary loose parts to bother with.



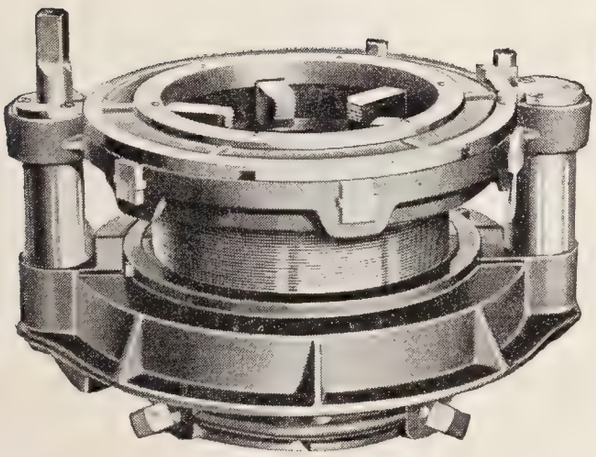
No. 41

CODE: NEBLICHTER



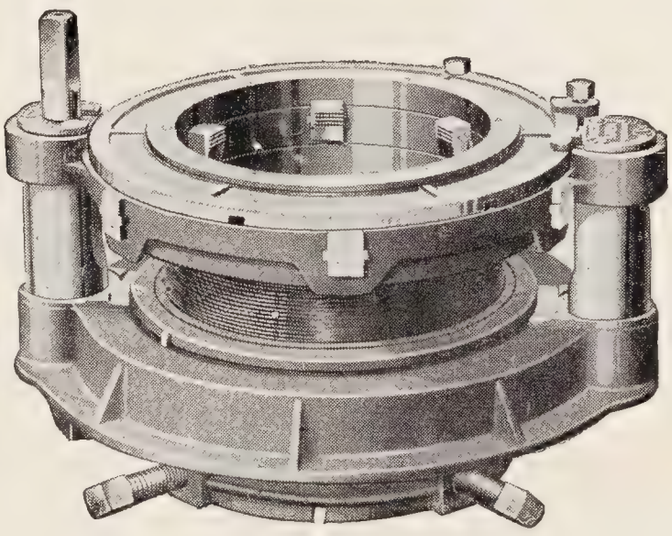
No. 61

CODE: NEBRIDARUM



No. 80

CODE: NEBRISENSE



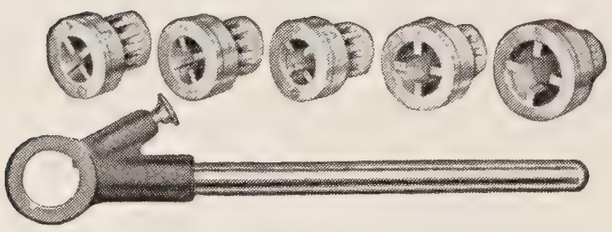
No. 90

CODE: NEBRODES

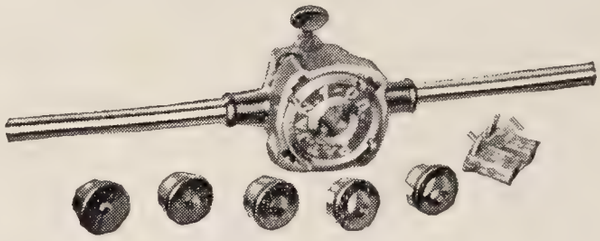
Number	41	61	80	90
Cuts Pipe.....Inches	2½ to 4	2½ to 6	4½ to 8	9 to 12
Price, Complete	110.00	220.00	300.00	500.00
Extra Dies, Complete Set	9.00	14.00	20.00	30.00

The No. 41 Stock has only one set of dies, the Nos. 61, 80 and 90 require two sets to cover their range.

TOLEDO PIPE THREADING DEVICES



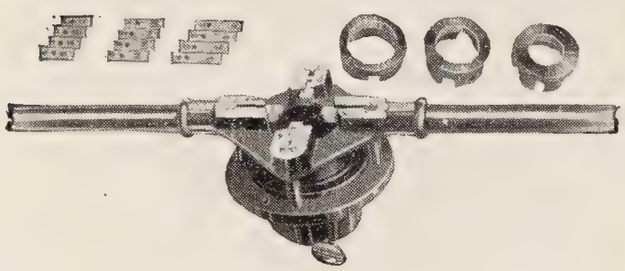
No. 00
CODE: NEBSTDEM



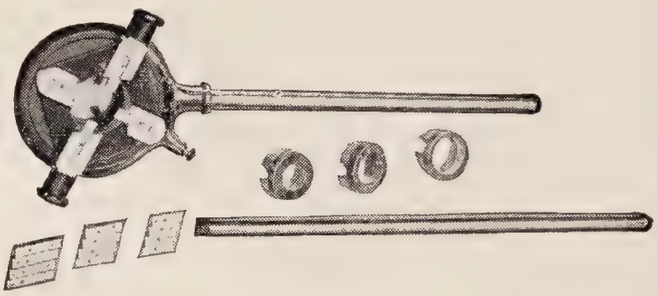
No. 0
CODE: NEBULAIRE

No. 00—A small, compact ⅛-inch to ¾-inch ratchet threader. An ideal tool for the corner job. Separate die heads for each size.

No. 0—Easiest operating ⅛-inch to ¾-inch threader. One set of dies threads ⅛-inch, another set ¼-inch to ⅜-inch, a third set ½-inch and ¾-inch pipe.



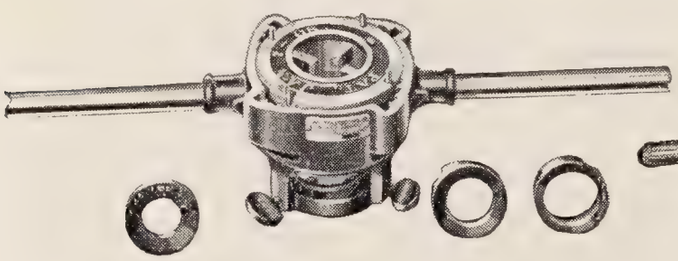
No. 1
CODE: NEBULANTIA



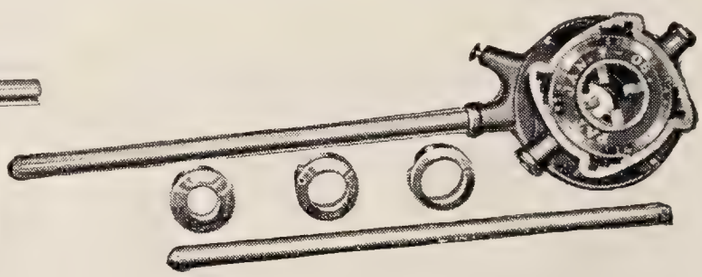
No. 1A
CODE: NEBULASNE

No. 1—A first class tool for threading 1-inch to 2-inch pipe. Also made special for cutting left-hand threads.

No. 1A—Like the No. 1, except equipped with ratchet, permitting cutting threads in close quarters.



No. 10
CODE: NEBULATOTE



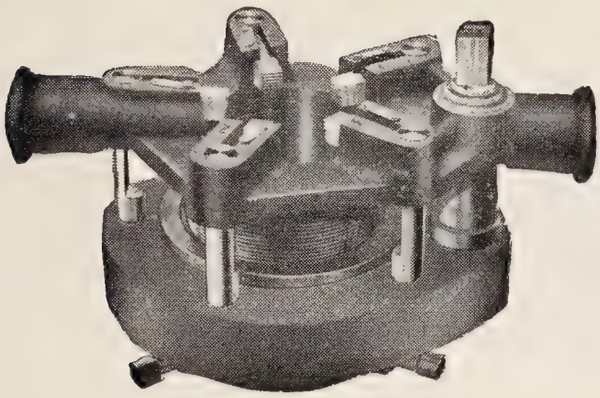
No. 10A
CODE: NEBULENTO

No. 10—Threads 1-inch to 2-inch pipe with one set of dies. Interchange of die sizes is easily and quickly made.

No. 10A—Is like the No. 10, except it is equipped with ratchet, permitting cutting threads in close quarters.

No.	Capacity Inches	Net Weight	List Price	Dies, Set 4 Segments	Dies, Complete Set
00	⅛ to ¾	9 lbs.	19.00	2.00 each	10.00 Comp. set
0	⅛ to ¾	8 lbs.	16.00	2.50 each	7.50 Comp. set
1	1 to 2	19 lbs.	24.00	2.50 each	10.00 Comp. set
1-A	1 to 2	22 lbs.	30.00	2.50 each	10.00 Comp. set
10	1 to 2	19 lbs.	28.00	2.75 each	2.75 Comp. set
10-A	1 to 2	26 lbs.	34.00	2.75 each	2.75 Comp. set
1½-R	2½ to 3	37 lbs.	50.00	4.00 each	8.00 Comp. set

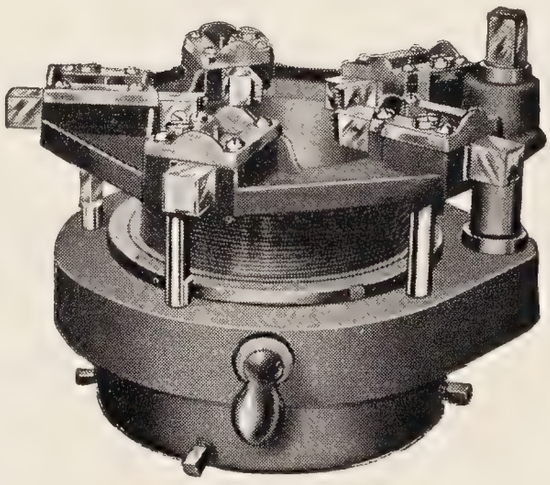
TOLEDO GEARED PIPE THREADING DEVICES



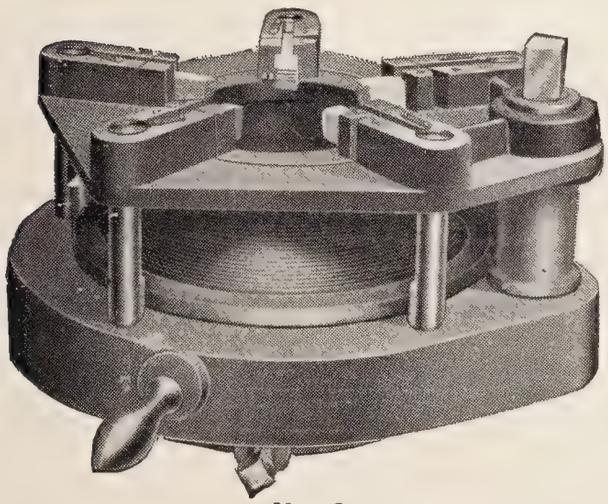
No. 2
CODE: NEBULOSIUS

No. 2—A portable geared tool threading 2½-inch to 4-inch pipe, works very rapidly and easily by hand.

No. 25—A geared tool threading 2½-inch to 6-inch pipe, with but one set of dies. Adjustment from one size to another is positive and durable. Is equipped with special long barrel bushings, making it very easy to center the tool on the pipe.



No. 25
CODE: NECABARIS



No. 3
CODE: NECABUNTUR

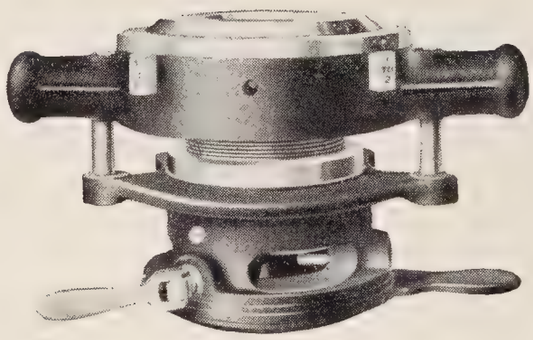
No. 3—A portable geared tool threading 4½-inch to 8-inch pipe, with a separate set of dies for each size pipe. An efficient tool that may be operated by one man by hand.

No. 4. Not Illustrated
CODE: NECANDORUM

No. 4—Threads 9-inch to 12-inch pipe so easily one man can operate it.

No.	Capacity Inches	Net Weight Pounds	List Price	Dies, Set 5 Segments	Dies, Complete Set
2	2½ to 4	97	100.00	8.00 each	32.00 Comp. set
25	2½ to 6	200	230.00	8.00 each	8.00 Comp. set
3	4½ to 8	215	300.00	12.00 each	60.00 Comp. set
4	9 to 12	329	500.00	20.00 each	60.00 Comp. set

OSTER MATCHLESS DIE STOCKS



CODE: NECAREMINI

Catalog No.	Sets of Dies	List Price	Extra Dies	Shipping Weight
3B 1-inch to 2-inch	1	30.00	3.50	25 lbs.

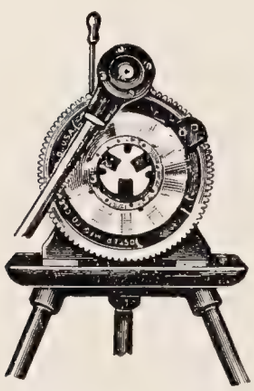
A self contained easy pipe threader without any loose dies, loose bushings, or set screws.

These stocks are equipped with narrow easy cutting dies, one set dies for all sizes 1 to 2-inch pipe.

Dies and Guides easily adjusted by a small lever handle.

The pipe is centered in the dies by the adjustable guides and these are locked on the pipe by a wing nut.

The leader screw is covered by a patented clip shield to keep the chips and dirt out of the threads.

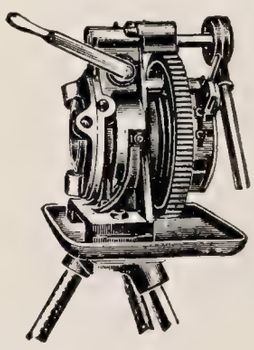


FRONT VIEW

OSTER GEARED DIE STOCKS AND LIGHT HAND PIPE THREADING MACHINES

GEARED AND COMPLETE WITH SELF-CENTERING AND SELF-LOCKING PIPE VISE

CODE: NECATRIX



SIDE VIEW

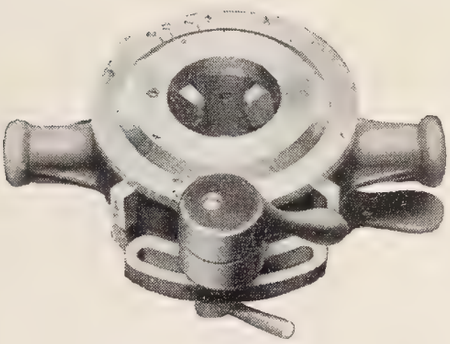
These are portable pipe tools. Can be used as a Die Stock; as a Bench Tool; or complete with Tripod stand. Strictly a one man outfit.

These tools have no leading screw; the dies are started with a lever handle. One movement of the lever brings the head to position for the next cut without backing over the finished threads. No pipe vise required.

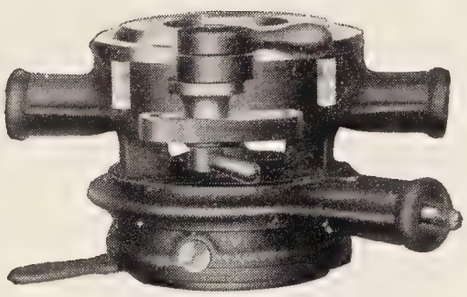
Number		15	16	17
Threads, pipe	Inches	¼ to 2	2½ to 4	2½ to 6
Price, with Bench Bracket	Each	110.00	200.00	320.00
Price, with Tripod, Complete	Each	125.00	225.00	350.00
Price, Dies per Set of Four Pieces		6.00	8.00	10.00

OSTER BULL DOG DIE STOCKS

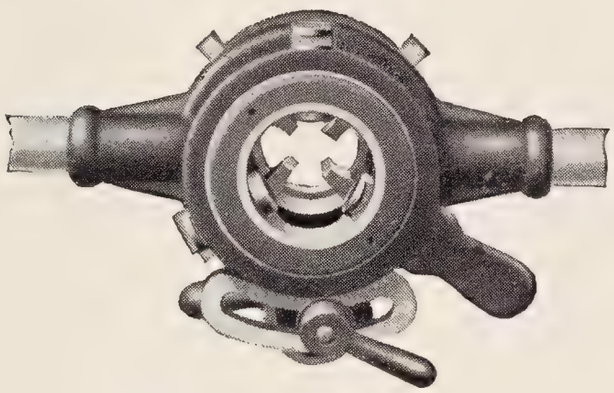
CODE: NECAVISTIS



REGULAR STOCK
NOS. 101 TO 104½



RATCHET STOCK
NOS. 102R TO 105½R



SHOWING BACK VIEW

This line of stocks has self-locking and adjustable dies. By moving the top handle to the right as far as it will go, the dies are set and held in place while cutting.

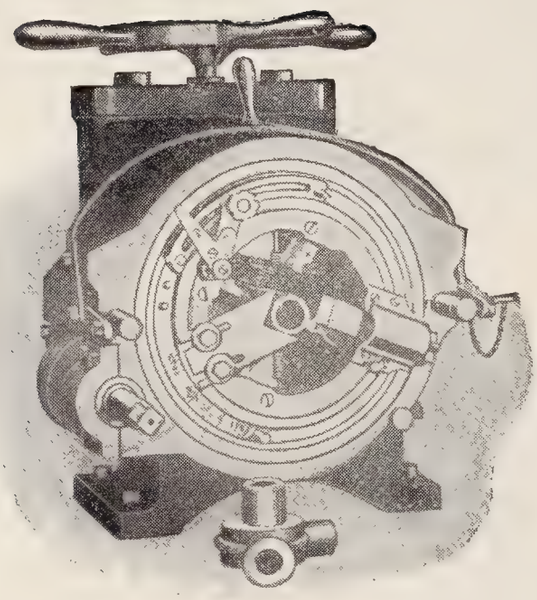
One movement of the handle will open or close the dies. No resetting or backing off the threads.

The tool is equipped with self-locking and centering guides. These guides are operated on a scroll and can be set to all sizes the tool will thread. The more pressure on the end of the guides, the more solid the locking arrangement.

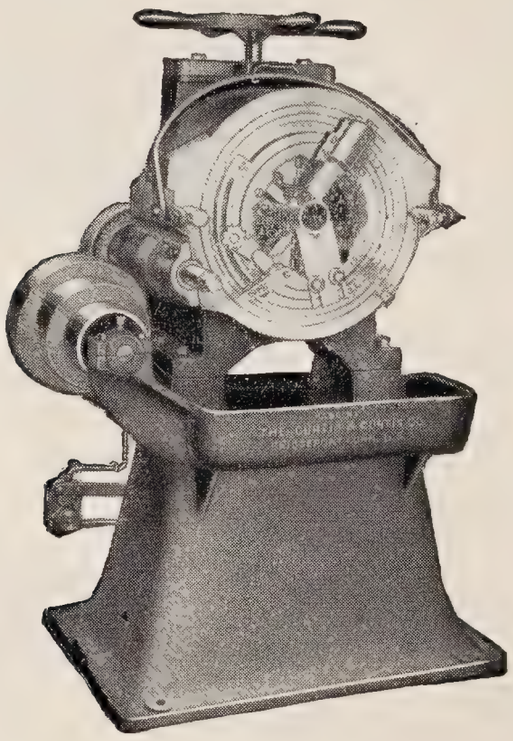
Range of Sizes of Pipe				Regular Stocks		Ratchet Stocks		Extra Dies	Shipping Wt. Complete	
One Set	One Set	One Set	One Set	Catalogue No.	List Price Com.	Catalogue No.	List Price Com.	Per Set (4 pcs.)	Plain	Ratchet
⅛	¼&⅜	½&¾		101	13.00			2.50	11 lbs.	
¼&⅜	½&¾	1&1¼		102	17.00	102 R	20.00	3.00	20 lbs.	24 lbs.
1&1¼	1½&2			103	22.00	103 R	27.00	3.50	27 lbs.	34 lbs.
½&¾	1&1¼	1½&2		104	25.00	104 R	30.00	3.50	29 lbs.	35 lbs.
¼&⅜	½&¾	1&1¼	1½&2	104½	28.00			3.50	30 lbs.	
1½&2	2½&3			105	40.00	105 R	50.00	5.00	62 lbs.	70 lbs.
1&1¼	1½&2	2½&3		105½	43.00	105½R	53.00	5.00	65 lbs.	73 lbs.
2½&3	3½&4			107	55.00	107 R	60.00	6.00	94 lbs.	138 lbs.
1½&2	2½&3	3½&4		107½	58.50	107½R	63.50	6.00	98 lbs.	142 lbs.
	2½&3	3½&4	4½&5			108 R	75.00	10.00		137 lbs.
1½&2	2½&3	3½&4	4½&5			108½R	80.00	10.00		140 lbs.

Nos. 105 to 107½, operated with four handles. Nos. 107R to 108½R, operated with four handles or two handles as a ratchet stock. All tools supplied with dies and handles complete at above list prices.

FORBES PIPE THREADING MACHINES



No. 58 HAND MACHINE
CODE: NECTARTEUG



No. 98A COMBINED HAND AND BELT DRIVEN
CODE: NECTOGALE

HAND MACHINES

Machine No.	*30	42	58	65	69	69-B
Range.....Inches	¼ to 2	1 to 4	1 to 6	1 to 8	2½ to 12	8 to 16 O. D.
Price.....Each	170.00	370.00	635.00	1200.00	2170.00	3335.00

*Cut-Off Attachment for No. 30 Machine $35.00 extra.

Stand for machines up to 6 inches, inclusive, $50.00 extra.

Stand for machines from 8 inches up, $70.00 extra.

COMBINED HAND AND BELT DRIVEN MACHINES

Machine No.	*70	84	96	98-A	108	120
Range.....Inches	¼ to 2	1 to 4	1 to 6	1 to 8	2½ to 12	8 to 16
Price.....Each	335.00	535.00	835.00	1785.00	3000.00	4500.00

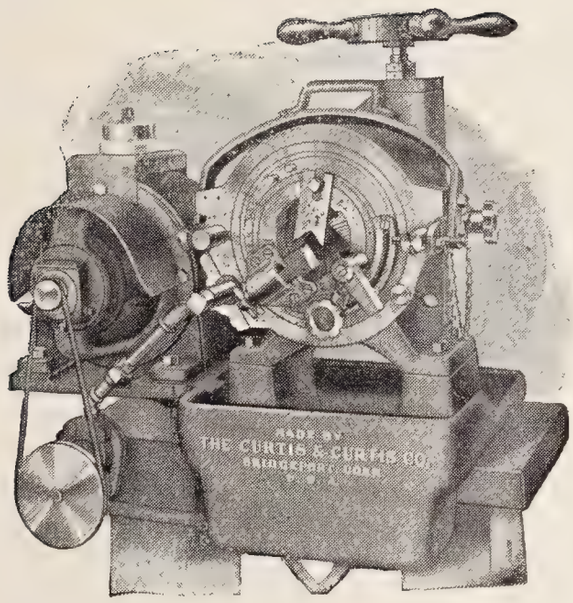
*Cut-Off Attachment for No. 70 Machine, $35.00 extra.

Machines Nos. 70, 84 and 96 are designed for bench use. They may be converted into floor machines by the addition of Floor Base and High Adjustable Pipe Rest at an additional cost of $100.00.

All above prices are for right hand operation only.

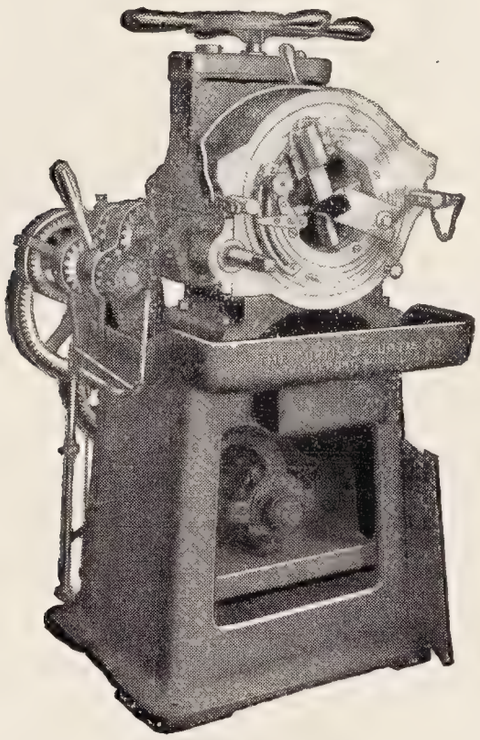
Machines for left hand operation or with other range of sizes, prices on application.

FORBES PIPE THREADING MACHINES



No. 430 MACHINE

CODE: NEDABIAH



No. 258 MACHINE

CODE: NEDERBONST

Machine No.	430	442	258	265	269	260-B
Range.....Inches	¼ to 2	1 to 4	1 to 6	1 to 8	2½to12	8 to 16
Price.....Each	725.00	975.00	1585.00	2420.00	4000.00	5200.00

Floor Base and High Adjustable Pipe Rest for Nos. 430 and 442, $100.00 extra.

The above prices are based on the supposition that the Motor is intended for the ordinary current, such as D. C., or 2 or 3 Phase A. C., while if it is for Single Phase A. C. or High Voltage, there will be an additional charge to the above mentioned price.

All above prices are for right hand operation only. Machines for left hand operation or with other range of sizes, prices on application.

SAUNDERS' PIPE CUTTERS

CODE: NEDERHOUDE

Number	1	2	3	4
Cuts Pipe from...Inches	⅛ to 1	1 to 2	2 to 3	2½ to 4
Price, Complete...Each	3.00	4.50	11.00	18.00
Price, Extra Wheels...Each	.24	.32	.60	.60
Price, Extra Rollers...Each	.24	.32	.50	.50
Price, Extra Pins...Each	.10	.10	.15	.15
Price, Extra Blocks and Wheels...Each	1.25	1.75	2.75	3.50

BARNES' THREE-WHEEL PIPE CUTTERS

CODE: NEFANDARIA

Number	1	2	3	4	5
Cuts Pipe from...Inches	⅛ to 1	½ to 2	1½ to 3	2½ to 4	4 to 6
Price...Each	4.50	6.00	10.00	20.00	30.00
Extra Cutter Wheels...Each	.25	.30	.40	.50	.75
Extra Wheel Pins...Each	.10	.10	.10	.15	.15
Extra Handles...Each	1.00	1.25	2.25	4.50	7.00

Larger sizes furnished. Prices on application.

KNIFE BLADE CUTTER WHEELS
KNURLED OR SMOOTH-EDGED

KNURLED EDGE
CODE: NEFROPSIDE

SMOOTH EDGE
CODE: NEGACEARAS

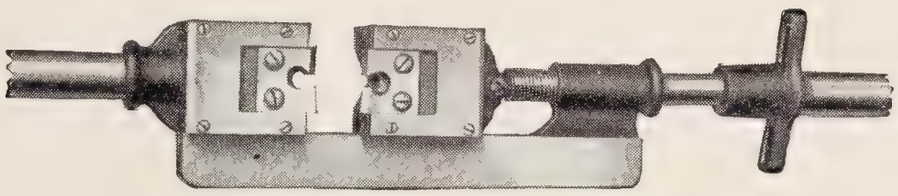
For Barnes		For Saunders		For Trimo	
Number	Each	Number	Each	Number	Each
1	$0.50	1	$0.50	1	$0.60
2	.60	2	.60	2	.60
3	.80	3	1.00	3	.90
4	1.00	4	1.10		
5	1.10	5	1.10		

These Thin Blade Cutter Wheels were the first ever placed on the market with a finished cutting edge. They are made from the highest grade of tool steel obtainable for the purpose and are hardened and tempered in oil. The blades are less than 1/16-inch thick and absolutely straight from the hub to the cutting edge. They cut with one-third the power and time required by the old type wheels. With the ordinary cutter wheels two-thirds of the operating power is wasted, putting a burr on the outside of the pipe which then requires more wasted power and time in filing this burr off.

BEAVER

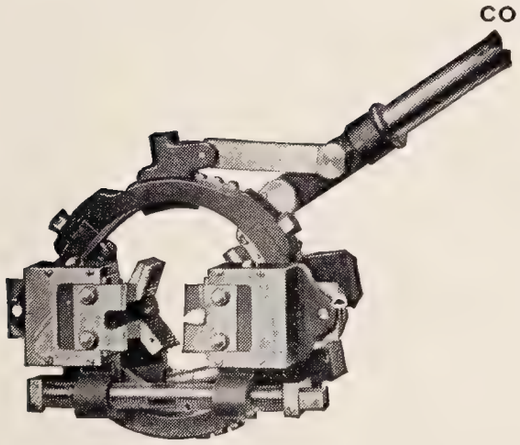
SQUARE-END PIPE CUTTERS

Beaver Square-End Pipe Cutters actually cut the pipe—leaving a clean cut square end, without reaming or filing—no burr. The knives feed automatically and are set, ready to cut when cutter is placed on pipe. Knives will last hundreds of cuts and can be resharpened on a grindstone.



No. 1 BEAVER CUTTER—⅛ TO 1 INCH
CODE: NEGARONO

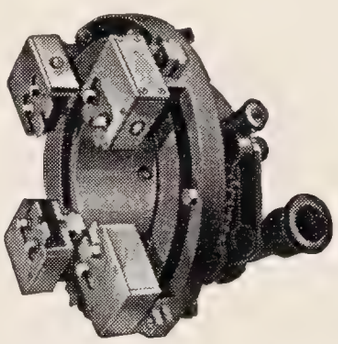
No. 5 BEAVER CUTTER—½ TO 2 INCH
CODE: NEGASSERO



No. 10—2½ TO 4 INCH
CODE: NEGATIF

The No. 10, cutting 2½ to 4″ is ratchet driven; can be used in ditch or at bench; is easily operated by one man. The same cutting principle is employed in the No. 10 as in smaller tools, but the gripping jaws and knives are operated by separate centering screws.

The No. 15 Beaver Square-End Cutter 2½ to 6-inch is similar to No. 10 except four cutting knives are used instead of two, making it possible to cut 6-inch pipe as rapidly as the smaller sizes.

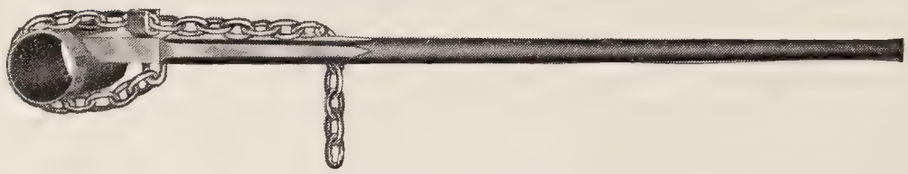


No. 15—BEAVER CUTTER
2½ TO 6 INCH
CODE: NEGATIVAM

Number	1	5	10	15
Cuts Pipe from ..... Inches	⅛ to 1	½ to 2	2½ to 4	2½ to 6
Price ..... Each	18.00	20.00	90.00	180.00
Extra Sets of Knives	1.20	1.50	2.50	5.00
Regrinding Knives	.30	.40	.70	1.40

The prices given above include two sets of extra knives.

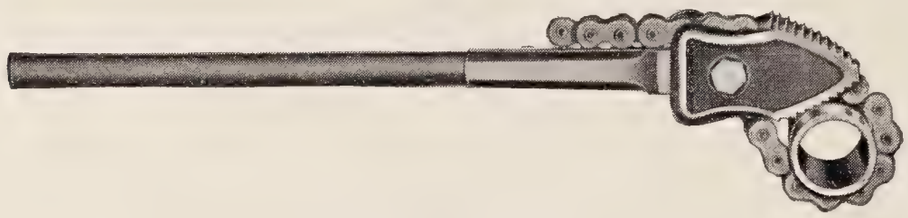
COMMON CHAIN PIPE TONGS



CODE: NEGAVERE

Number	2	3	4	5	6	7
For Size Pipes.....Inches	1 to 2	1¼ to 4	2 to 6	2½ to 8	4 to 10	4 to 16
Length of Lever.....Feet	2¾	3	4	5	6	7
Average Weight....Pounds	7	12	24	33	50	100
Price.....Each	5.50	6.25	9.00	12.50	16.00	30.00

UNIVERSAL CHAIN PIPE TONGS



CODE: NEGENKUILE

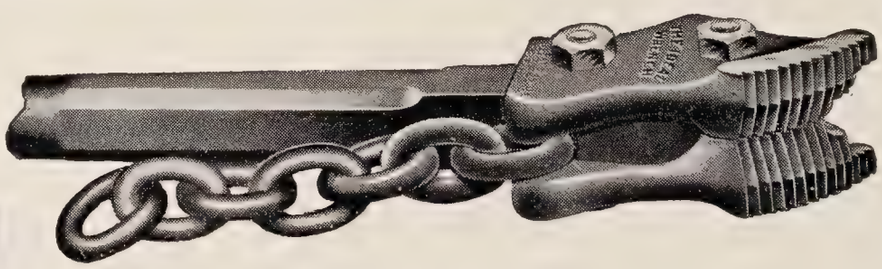
WITH FLAT OR CABLE LINK CHAIN

Flat Link Chain will be furnished unless Cable is specified.

Number	10	11	12	13	13½	14	15
For Sizes Pipe....Inches	⅛ to ¾	⅛ to 1½	¼ to 2½	¾ to 4	1 to 6	1½ to 8	2 to 12
Length.....Inches	13¾	20	27	37	44½	50½	64½
Weight.....Pounds	1¾	5¾	10	16	24	31	50
Price.....Each	5.00	7.00	10.00	14.00	18.00	22.00	36.00
Ex. Flat or Cab. Ch'n Ea.	1.50	2.00	3.00	5.00	7.00	9.00	15.00
Extra Jaws.....Per Pair	2.00	3.50	5.50	8.00	9.50	11.00	15.00

IDEAL CHAIN WRENCH

IDEAL FLANGE ATTACHMENT



CODE: NEGERTJES

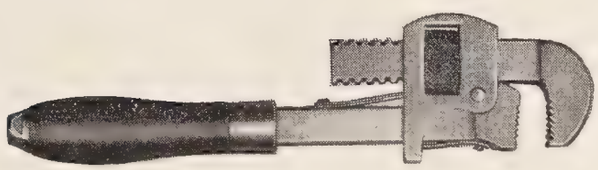
FLANGE LINK

Number	2	3	4	5
For Sizes Pipe.....Inches	½ to 3½	1 to 5	2 to 8	2½ to 12
Length.....Inches	27	38	49	61
Weight.....Pounds	10	18	28	50
Price with Cable Chain.....Each	6.00	8.00	11.00	16.00
Price with Flat Chain.....Each	9.00	11.20	15.40	22.40
Extra Jaws, Complete.....Per Pair	3.50	5.00	6.50	8.25
Flange Link.....Each	3.00	4.00	5.00	6.00
Extra Handle.....Each	2.10	3.25	4.75	6.90
Extra Cable Chain.....Each	.95	1.20	1.70	3.00
Extra Flat Link Chain.....Each	4.00	4.50	5.00	9.00

STILLSON'S

PIPE WRENCHES

PIPE IS NOT CRUSHED BY ITS USE



CODE: NEGLEGENS

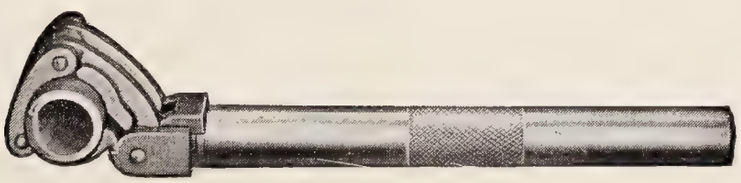
Length, open . . . Inches	6	8	10	14	18	24	36	48
For Sizes Pipe . . Inches	1/8 to 1/2	1/8 to 3/4	1/8 to 1	1/4 to 1 1/2	1/4 to 2	1/4 to 2 1/2	1/4 to 3 1/2	1 to 5
Price . . . . . Each	2.00	2.25	2.50	3.50	5.00	7.25	13.50	20.00
Extra Frames . . . . Each	.38	.42	.50	.60	.75	.95	1.70	2.20
Extra Nuts . . . . . Each	.12	.15	.20	.30	.35	.55	1.10	1.50
Extra Jaws . . . . . Each	.75	.80	.85	1.15	1.75	2.25	4.35	7.50

Unless otherwise specified, wrenches 10-inch and larger will always be furnished with steel handles.

PARMELEE

PIPE WRENCHES

ESPECIALLY ADAPTED FOR HANDLING BRASS PIPE, SMOOTH RODS OR NICKEL PLATED TUBING



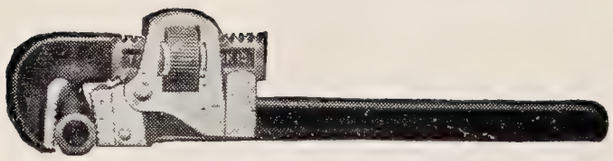
CODE: NEGORIJ

Size Number of Set	Price per Set Complete	For Sizes of Pipe Inches	Length of Handle Inches	Extra Handles Price Each	Extra Girths Price for Each Size
No. 10	10.00	3/8 to 1	10	4.50	3/8, 1/2, 3/4, 1.90
No. 20	15.00	1 to 2	20	6.00	1, 1 1/4 . . . . . 2.50 1 1/2, 2 . . . . . 3.15
No. 30	19.00	2 to 3	25	10.00	2, 2 1/2, 3 . . . . 3.75
No. 40	Price on Application	3 and 4		Price on Application	3 and 4 Price on . . . . Application

Positive grip; no lost motion; has no teeth, and will not mar the pipe or threads; will not slip on oily, galvanized or polished pipe.

Makes or breaks the tighest joint, easily.

Can be operated in close quarters and where space between pipes is limited.



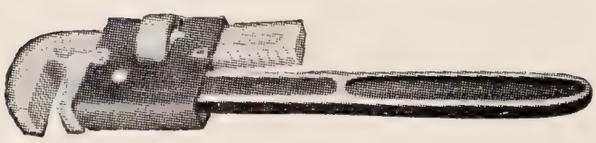
CODE: NEGREGGIA

TRIMO PIPE WRENCHES

Length, open...Inches	6	8	10	14	18	24	36	48
Adjustable to Sizes ...	⅛-inch wire to ½-inch pipe	⅛-inch wire to ¾-inch pipe	⅛-inch wire to 1-inch pipe	¼-inch wire to 1½-inch pipe	¼-inch wire to 2-inch pipe	¼-inch wire to 2½-inch pipe	½-inch pipe to 3½-inch pipe	1-inch pipe to 5-inch pipe
Price.....Each	2.00	2.25	2.50	3.50	5.00	7.25	13.50	20.00
Jaws.....Each	.75	.80	.85	1.15	1.75	2.25	4.35	7.50
Nuts.....Each	.12	.15	.20	.30	.35	.55	1.10	1.50
Inserted Jaws....Each	.35	.40	.50	.60	.70	.80	1.10	2.00
Frames.....Each	.38	.42	.50	.60	.75	.95	1.70	2.20
Springs.....Each	.03	.03	.03	.03	.04	.04	.04	.04
Frame Pins.....Each	.03	.03	.04	.04	.04	.04	.05	.05
Jaw Pins.....Each	.03	.03	.04	.04	.04	.04	.05	.05
Nut Guards..Per Pair.	.15	.15	.20	.30	.35	.45	.55	.65

In ordering parts, state the size of wrench.

LARCO PIPE AND MONKEY WRENCHES



PIPE WRENCH

CODE: NEKROLOOG

MONKEY WRENCH

CODE: NEMESIACOS

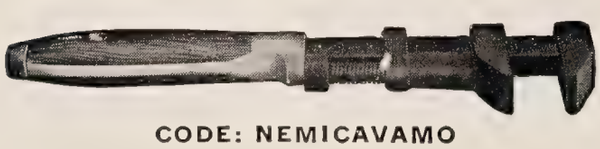
PIPE WRENCH

Size.....Inches	8	10	14	18	24
Taking Pipe Up To.....Inches	¾	1	1½	2	2½
Price, Complete.....Each	2.25	2.50	3.50	5.00	7.25
Movable Hook Jaw.....Each	.80	.85	1.15	1.75	2.25
Inserted Jaw.....Each	.50	.60	.70	.80	1.00
Knurled Thumb Screws.....Each	.06	.08	.10	.10	.12
Adjusting Nuts.....Each	.20	.30	.40	.50	.60
Springs.....Each	.10	.10	.10	.10	.12
Frames.....Each	.56	.64	.70	.80	1.00
Bridges.....Each	.10	.10	.10	.10	.12
Frame Pin (Rivet).....Each	.03	.04	.04	.04	.04
Handles.....Each	1.00	1.10	1.40	2.10	3.30

MONKEY WRENCH

Size.....Inches	8	10	14	18	
Price, Complete.....Each	2.25	2.50	3.50	5.00	

Monkey Wrench Repairs same as Pipe Wrenches above.



CODE: NEMICAVAMO

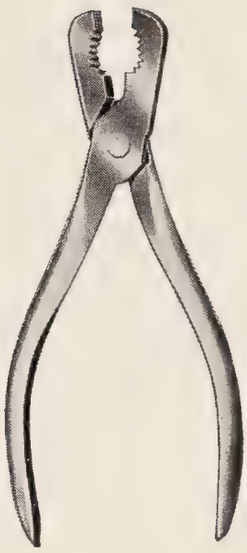
KNIFE HANDLE WRENCHES

Size.....Inches	6	8	10	12	15	18	21
Black, Price.....Per Dozen	15.00	18.00	22.00	28.00	38.00	48.00	58.00

GAS PLIERS

BURNER PLIERS
TWO HOLES, 7-INCH
CODE: NEMORIVAGA

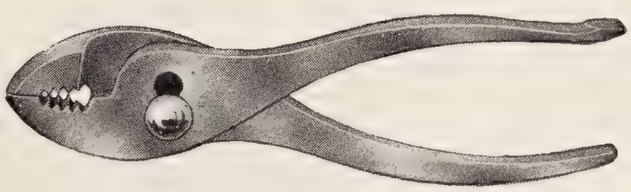
GAS PLIERS
7 TO 14-INCH
CODE: NEMISTADE



BURNER PLIERS
ONE HOLE, 5 AND 6-INCH
CODE: NEMOPANTHE

Size.....Inches	5	6	7	8	9	10	12	14
Polished.....Per dozen			7.40	8.25	9.25	10.70	13.00	17.00
Burner Pliers, Polished.....Per dozen	6.50	6.50	10.00					

COMBINATION PLIERS



GAS PLIERS, WIRE CUTTERS, WRENCH AND SCREW DRIVER COMBINED
CODE: NEMOSOME

Size.....Inches	6	8	10
Price, Black.....Per Dozen	13.50	16.00	18.00
Price, Plated.....Per Dozen	15.00	18.00	21.00

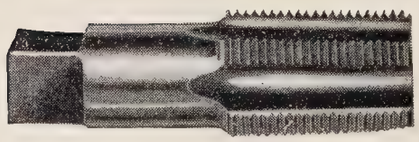
GAS FITTERS' AUGERS

CODE: NENNENDUNG

Size of Pipe.....Inches	¼	⅜	½	¾	1	1¼	1½	2	2½
Size of Pipe.....Millimeters	6	10	13	19	25	32	38	50	64
Size of Auger.....Inches	⅝	¾	⅞	1¼	1½	1¾	2	2½	3
Price.....Each	1.25	1.50	1.75	2.50	3.00	3.50	4.00	5.00	6.00

In ordering Augers, state pipe size.

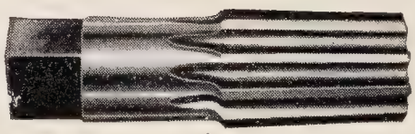
PIPE TAPS



CODE: NEPAULESE

Size.....Inches	1/8	1/4	3/8	1/2	3/4	1
Size.....Millimeters	3	6	10	13	19	25
Price.....Each	1.00	1.20	1.60	2.00	2.80	4.40
Threads.....Per inch	27	18	18	14	14	11½
Size.....Inches	1¼	1½	2	2½	3	
Size.....Millimeters	32	38	50	64	76	
Price.....Each	5.00	6.60	10.00	15.00	22.50	
Threads.....Per inch	11½	11½	11½	8	8	

PIPE REAMERS

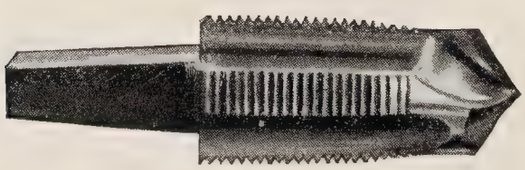


CODE: NEPHROTOME

Size.....Inches	1/4	3/8	1/2	3/4	1
Size.....Millimeters	6	10	13	19	25
Price.....Each	1.20	1.60	2.00	2.80	4.40
Size.....Inches	1¼	1½	2	2½	3
Size.....Millimeters	32	38	50	64	76
Price.....Each	5.00	6.60	10.00	15.00	22.50

COMBINED

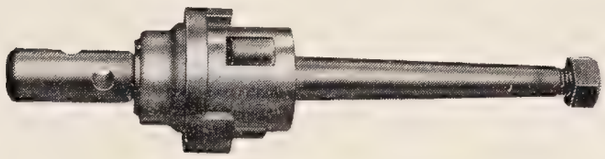
DRILL, REAMER AND TAP



CODE: NEPOTIANUS

Size.....Inches	1/4	3/8	1/2	3/4	1	1¼	1½	2
Size.....Millimeters	6	10	13	19	25	32	38	50
Price.....Each	2.25	2.50	3.00	4.50	6.00	7.25	8.50	10.75

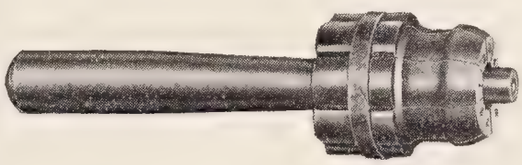
BOILER TUBE EXPANDERS



ROLLER TYPE

CODE: NEPTONEMUS

Size of Tube, Outside..Inches	1	1¼	1½	1¾	1⅞	2	2¼	2½	2¾
Price .....Each	10.00	10.00	10.00	10.00	10.00	10.00	12.00	14.00	16.00
Size of Tube, Outside..Inches	3	3¼	3½	3¾	4	4¼	4½	5	6
Price .....Each	18.00	20.00	23.00	25.00	30.00	40.00	50.00	60.00	70.00

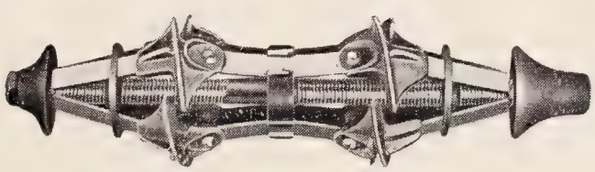


SPRING TYPE

CODE: NEQUISSIMA

Size of Tube, Outside.....Inches	1	1¼	1½	1¾	2	2¼
Price .....Each	12.00	12.00	12.00	12.00	12.00	13.00
Size of Tube, Outside.....Inches	2½	2¾	3	3¼	3½	4
Price .....Each	15.00	18.00	22.00	26.00	30.00	33.00

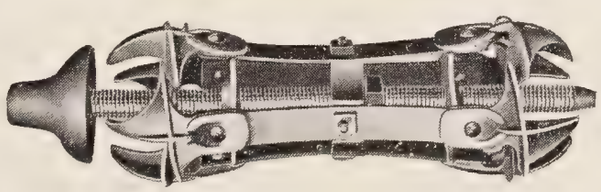
BOILER TUBE SCRAPERS



THE BUFFALO DUPLEX

CODE: NERBORUTO

Outside Diameter of Tube. In.	1¾	2	2¼	2½	2¾	3	3¼	3½	3¾	4
Price .....Each	2.00	2.00	2.25	2.50	2.75	3.00	3.25	3.50	3.75	4.00



THE ENGINEERS' FAVORITE

CODE: NERVADURA

Outside Diameter of Tube. In.	1¾	2	2¼	2½	2¾	3	3¼	3½	3¾	4
Price .....Each	2.00	2.00	2.25	2.50	2.75	3.00	3.25	3.50	3.75	4.00

PIPE PRACTICE

MEASUREMENT OF PIPE

On orders calling for commercial sizes of pipe to be furnished with threads and couplings in sizes ⅛ to 12-inch, inclusive, where orders specify quantity in lineal feet, it is understood that random lengths, threaded both ends, with coupling on one end, will be shipped, and the measurement is charged from end to end, that is over all, including coupling.

Orders or inquiries covering cut lengths of any size should specify whether plain ends, threads only, threads and couplings or flanges are required. A separate charge is made for couplings or flanges, either loose or screwed on pipe, when pipe is ordered cut to specified lengths.

Orders or inquiries covering pipe larger than 12-inch should specify the actual outside diameter of the pipe and the thickness of the wall. See table, page 570.

Standard weight pipe is listed and carried in stock threaded and coupled and will be shipped unless order specifies otherwise. Extra Strong, Double Extra Strong, Hydraulic, and Large O. D. Pipe is listed plain ends only and will be so shipped unless order specifies otherwise. An extra charge is made for threads and couplings on these weights.

For pipe smoothed on the inside, known as reamed and drifted, an extra charge is made. Such pipe is furnished in random lengths 20 feet and shorter.

Random lengths of Extra Strong and Double Extra Strong Pipe are considered to be 12 to 22 feet, we to have the privilege of supplying not to exceed 5 per cent of total order in lengths 6 to 12 feet. For cut lengths of any size an extra charge above random lengths will be made.

For galvanized or asphalted pipe an extra charge above black will be made.

Sizes 8, 10 and 12-inch Standard Pipe are listed in several weights and orders or inquiries should specify the weight required.

PRICE LIST OF
STANDARD THREADS FOR WROUGHT IRON PIPE

Size..Inches	⅛	¼	⅜	½	¾	1	1¼	1½	2	2½	3	3½	4	4½
Size....Mm	3	6	10	13	19	25	32	38	50	64	76	90	100	113
Price..Each	.05	.05	.05	.05	.05	.06	.07	.08	.10	.15	.20	.25	.35	.45
Size..Inches	5	6	7	8	9	10	12	14	15	16	18	20	22	24
Size....Mm	125	150	175	200	225	250	300	350	375	400	450	500	550	600
Price..Each	.55	.70	.85	1.00	1.25	1.50	2.50	3.50	3.50	5.00	8.00	10.00	12.50	15.00

PRICE LIST OF LOCK-NUT THREADS

Size.....Inches	¼	⅜	½	¾	1	1¼	1½	2	2½	3	3½	4
Size...Millimeters	6	10	13	19	25	32	38	50	64	76	90	100
Price.....Each	.10	.10	.10	.10	.12	.14	.16	.20	.30	.40	.50	.70

DRILLING AND TAPPING PIPE HEADERS
MADE FROM EITHER 3 OR 4-INCH PIPE

Size of Holes for Iron Pipe.....Inches	½	¾	1	1¼
Size of Holes for Iron Pipe.....Millimeters	13	19	25	32
Price per Hole, Drilled and Tapped in Standard Pipe.....	.15	.15	.20	.25
Price per Hole, Drilled and Tapped in Extra Heavy Pipe....	.18	.18	.25	.30

DRILLING AND TAPPING PIPE HEADERS
MADE FROM EITHER 5 OR 6-INCH PIPE

Size of Holes for Iron Pipe.....Inches	½	¾	1	1¼	1½	2
Size of Holes for Iron Pipe.....Millimeters	13	19	25	32	38	50
Price per Hole, Drilled and Tapped in Standard Pipe...	.18	.18	.25	.30	.40	.45
Price per Hole, Drilled and Tapped in Extra Heavy Pipe	.20	.20	.30	.35	.45	.50

WROUGHT IRON AND STEEL PIPE

PIPE MILL TESTS

There are no established standards for mill tests on wrought pipe.

The various manufacturers have their own schedule of tests, which average as follows:

STANDARD BUTT WELDED WROUGHT PIPE

The tests on ⅛ to 3 inch, inclusive, range from 700 to 1,000 pounds, according to size.

STANDARD LAP WELDED WROUGHT PIPE

The tests on 1½ to 12 inch, inclusive, range from 500 to 1,000 pounds, according to size.

EXTRA STRONG BUTT WELDED WROUGHT PIPE

The tests on ⅛ to 3 inch, inclusive, range from 700 to 1,500 pounds, according to size.

EXTRA STRONG LAP WELDED WROUGHT PIPE

The tests on 1½ to 12 inch, inclusive, range from 1,100 to 2,500 pounds, according to size.

DOUBLE EXTRA STRONG BUTT WELDED WROUGHT PIPE

The tests on ⅜ to 2½ inch, inclusive, range from 700 to 2,200 pounds, according to size.

DOUBLE EXTRA STRONG LAP WELDED WROUGHT PIPE

The tests on 1½ to 8 inch, inclusive, range from 2,000 to 3,000 pounds, according to size.

The above tests are made by the mill simply to detect any defects in the weld or other portions of the pipe and are not made as a basis from which to figure safe working pressures.

SAFE WORKING PRESSURES

Numerous factory tests to determine the actual bursting pressure of wrought pipe have proved Barlow's formula to be correct. This formula follows:

$$\text{BP equals} \frac{2T \times TS}{OD}$$

in which BP equals bursting pressure in pounds per square inch.
T equals thickness of the wall in inches.
OD equals outside diameter of the pipe in inches.
TS equals tensile strength of material per square inch.

The value of TS was determined from actual tests to be 40,000 pounds per square inch for butt welded steel pipe and 50,000 pounds for lap welded steel pipe.

The table on the following page is based on the formula given above. The working pressures given are based on a factor of safety of eight.

WROUGHT STEEL PIPE

THEORETICAL BURSTING AND WORKING PRESSURES POUNDS PER SQUARE INCH

Size	Size	Standard		Extra Strong		Double Extra Strong		Large O. D.			
		Bursting Pressure Barlow's Formula	Working Pressure Factor 8	Bursting Pressure Barlow's Formula	Working Pressure Factor 8	Bursting Pressure Barlow's Formula	Working Pressure Factor 8	⅜ Inch Thick Bursting Pressure Barlow's Formula	Working Pressure Factor 8	½ Inch Thick Bursting Pressure Barlow's Formula	Working Pressure Factor 8
Inches	Millimeters										
⅛	3	13,432	1679	18,760	2345						
¼	6	13,032	1629	17,624	2203						
⅜	10	10,784	1348	14,928	1866						
½	13	10,384	1298	14,000	1750	28,000	3500				
¾	19	8,608	1076	11,728	1466	23,464	2933				
1	25	8,088	1011	10,888	1361	21,776	2722				
1¼	32	6,744	843	9,200	1150	18,408	2301				
1½	38	6,104	763	8,416	1052	16,840	2105				
2	50	5,184	648	7,336	917	14,680	1835				
2½	64	5,648	706	7,680	960	15,360	1920				
3	76	4,936	617	6,856	857	13,714	1714				
3½	90	5,610	701	7,950	994	15,900	1987				
4	100	5,266	658	7,480	935	14,970	1871				
4½	113	4,940	618	7,100	887	14,200	1775				
5	125	4,630	579	6,740	842	13,480	1685				
6	150	4,220	528	6,520	815	13,040	1630				
7	175	3,940	493	6,550	819	11,470	1434				
8	200	3,720	466	5,780	722	10,140	1267				
9	225	3,550	444	5,190	649						
10	250	3,390	424	4,650	581						
12	300	2,940	368	3,920	490						
14	350							2,680	335	3,570	446
15	375							2,500	313	3,333	417
16	400							2,340	293	3,120	390
18	450							2,080	260	2,770	346
20	500							1,870	234	2,500	313
22	550							1,700	213	2,270	284
24	600							1,560	195	2,080	260

In the above table, butt welded pipe was figured on sizes 3 inch and smaller and lap welded pipe sizes 3½ inch and larger.

PRICE LIST—WROUGHT PIPE

BLACK AND GALVANIZED

AS ADOPTED JANUARY 1, 1913

TO TAKE THE PLACE OF ALL PREVIOUS LISTS AND SUBJECT TO CHANGE WITHOUT NOTICE

Nominal Inside Diameter		Standard CODE: RESCOLDERA			Extra Strong CODE RESELVESCO		Double Extra Strong CODE: RESERVAGEN	
Size Inches	Size Millimeters	Price Per Foot	Nominal weight Per Foot Plain Ends	Nominal Weight Per Foot Threaded and Coupled	Price Per Foot	Nominal Weight Per Foot Plain Ends	Price Per Foot	Nominal Weight Per Foot Plain Ends
1/8	3	.05½	.244	.245	.12	.314		
1/4	6	.06	.424	.425	.07½	.535		
3/8	10	.06	.567	.568	.07½	.738		
1/2	13	.08½	.850	.852	.11	1.087	.32	1.714
3/4	19	.11½	1.130	1.134	.15	1.473	.35	2.440
1	25	.17	1.678	1.684	.22	2.171	.37	3.659
1¼	32	.23	2.272	2.281	.30	2.996	.52½	5.214
1½	38	.27½	2.717	2.731	.36½	3.631	.65	6.408
2	50	.37	3.652	3.678	.50½	5.022	.91	9.029
2½	64	.58½	5.793	5.819	.77	7.661	1.37	13.695
3	76	.76½	7.575	7.616	1.03	10.252	1.86	18.583
3½	90	.92	9.109	9.202	1.25	12.505	2.30	22.850
4	100	1.09	10.790	10.889	1.50	14.983	2.76	27.541
4½	113	1.27	12.538	12.642	1.80	17.611	3.26	32.530
5	125	1.48	14.617	14.810	2.08	20.778	3.86	38.552
6	150	1.92	18.974	19.185	2.86	28.573	5.32	53.160
7	175	2.38	23.544	23.769	3.81	38.048	6.35	63.079
8	200	2.50	24.696	25.000				
8	200	2.88	28.554	28.809	4.34	43.388	7.25	72.424
9	225	3.45	33.907	34.188	4.90	48.728		
10	250	3.20	31.201	32.000				
10	250	3.50	34.240	35.000				
10	250	4.12	40.483	41.132	5.48	54.735		
11	275	4.63	45.557	46.247	6.10	60.075		
12	300	4.50	43.773	45.000	6.55	65.415		
12	300	5.07	49.562	50.706				

HYDRAULIC WROUGHT PIPE

CODE: RESIDEBUNT

SIZES 9, 10, 11 AND 12 INCH

ALL WEIGHTS AND DIMENSIONS ARE NOMINAL

SIZES		THICKNESS							
Nominal Inside Diam	Actual Outside Diam.	Fraction 5/8 Inch Decimal .625		3/4 Inch .75		7/8 Inch .875		1 In. 1.00	
		List	Weight	List	Weight	List	Weight	List	Weight
9	9 5/8	6.01	60.08	7.11	71.09	8.18	81.77	9.22	92.12
10	10 3/4	6.76	67.59	8.01	80.10	9.23	92.28	10.42	104.13
11	11 3/4	7.43	74.26	8.82	88.11	10.17	101.63	11.49	114.81
12	12 3/4	8.10	80.94	9.62	96.12	11.10	110.97	12.55	125.49

PRICE LIST OF

LARGE O. D. WROUGHT PIPE

REVISED AND ADOPTED JANUARY 1, 1913

TO TAKE THE PLACE OF ALL PREVIOUS LISTS AND SUBJECT TO CHANGE WITHOUT NOTICE

CODE: RESILITOTE

Outside Diameter of Pipe Inches	1/4 Inch Thick	5/16 Inch Thick	3/8 Inch Thick	7/16 Inch Thick	1/2 Inch Thick	9/16 Inch Thick	5/8 Inch Thick	3/4 Inch Thick	1 Inch Thick
	Price Per Foot	Price Per Foot	Price Per Foot	Price Per Foot	Price Per Foot	Price Per Foot	Price Per Foot	Price Per Foot	Price Per Foot
14	3.68	4.57	5.46	6.34	7.21	8.08	8.93	10.62	13.89
15	3.94	4.91	5.86	6.81	7.75	8.68	9.60	11.42	14.96
16	4.21	5.24	6.26	7.28	8.28	9.28	10.27	12.22	16.03
17	4.48	5.57	6.66	7.74	8.82	9.88	10.94	13.02	17.09
18	4.74	5.91	7.06	8.21	9.35	10.48	11.60	13.82	18.16
20		6.58	7.86	9.15	10.42	11.68	12.94	15.42	20.30
21		6.91	8.27	9.61	10.95	12.28	13.61	16.23	
22		7.24	8.67	10.08	11.49	12.88	14.27	17.03	
24			9.47	11.01	12.55	14.09	15.61	18.63	
26			10.27	11.95	13.62	15.29	16.94	20.23	
28				12.88	14.69	16.49	18.28	21.83	
30				13.82	15.76	17.69	19.61	23.43	

NOMINAL WEIGHT IN POUNDS PER FOOT—STANDARD O. D. PIPE

Outside Diameter of Pipe Inches	1/4 Inch Thick	5/16 Inch Thick	3/8 Inch Thick	7/16 Inch Thick	1/2 Inch Thick	9/16 Inch Thick	5/8 Inch Thick	3/4 Inch Thick	1 Inch Thick
	Weight Per Foot Pounds	Weight Per Foot Pounds	Weight Per Foot Pounds	Weight Per Foot Pounds	Weight Per Foot Pounds	Weight Per Foot Pounds	Weight Per Foot Pounds	Weight Per Foot Pounds	Weight Per Foot Pounds
14	36.71	45.68	54.57	63.37	72.10	80.73	89.28	106.13	138.84
15	39.38	49.02	58.57	68.04	77.43	86.73	95.95	114.14	149.52
16	42.05	52.36	62.58	72.72	82.77	92.74	102.63	122.15	160.20
17	44.72	55.69	66.58	77.39	88.11	98.75	109.30	130.16	170.88
18	47.39	59.03	70.59	82.06	93.45	104.76	115.98	138.17	181.56
20		65.71	78.60	91.41	104.13	116.77	129.33	154.19	202.92
21		69.04	82.60	96.08	109.47	122.78	136.00	162.20	
22		72.38	86.61	100.75	114.81	128.79	142.68	170.21	
24			94.62	110.10	125.49	140.80	156.03	186.23	
26			102.63	119.44	136.17	152.82	169.38	202.25	
28				128.79	146.85	164.83	182.73	218.27	
30				138.13	157.53	176.85	196.08	234.30	

Large O. D. Pipe will be shipped in random lengths and plain ends unless otherwise ordered. For this pipe, fitted with threads and couplings, an extra charge will be made above regular.

For cut lengths, an extra charge will be made above random lengths.

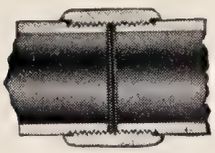
For galvanized or asphalted pipe, an extra charge will be made above black.

Large O. D. pipe in sizes up to 96 inches O. D. can be furnished. Prices on application.

We can thread pipe up to 24-inch inclusive, and can furnish wrought couplings up to 20-inch inclusive.

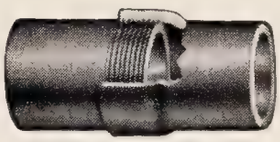
We regularly Cranelap or weld flanges on pipe 3 inches to 30 inches, inclusive.

WROUGHT WELL CASING



SCREW AND SOCKET JOINT

CODE: RESOLVIRTE



INSERTED JOINT

CODE: RESORBEBOR

ALL WEIGHTS AND DIMENSIONS ARE NOMINAL

Size	Diameters		Thickness	Weight per Foot		Threads per Inch	Inserted Joint	
	External	Internal		Plain Ends	Threads and Couplings		Length of Joint	Diameter of Joint
2	2.250	2.050	.100	2.296	2.34	14	.967	2.340
2 1/4	2.500	2.284	.108	2.759	2.82	14	.992	2.606
2 1/2	2.750	2.524	.113	3.182	3.25	14	1.017	2.866
2 3/4	3.000	2.768	.116	3.572	3.65	14	1.042	3.122
3	3.250	3.010	.120	4.011	4.10	14	1.067	3.380
3 1/4	3.500	3.250	.125	4.505	4.60	14	1.092	3.640
3 1/2	3.750	3.492	.129	4.988	5.10	14	1.117	3.898
3 3/4	4.000	3.732	.134	5.532	5.65	14	1.142	4.158
4	4.250	3.974	.138	6.060	6.20	14	1.167	4.416
4 1/4	4.500	4.216	.142	6.609	6.75	14	1.192	4.674
4 1/4	4.500	4.090	.205	9.403	9.50	14		
4 1/2	4.750	4.460	.145	7.131	7.25	14	1.217	4.930
4 1/2	4.750	4.364	.193	9.393	9.50	14		
4 3/4	5.000	4.696	.152	7.870	8.00	14	1.242	5.194
5	5.250	4.944	.153	8.328	8.50	14	1.267	5.446
5	5.250	4.886	.182	9.851	10.00	14		
5	5.250	4.886	.182	9.851	10.00	11 1/2		
5	5.250	4.768	.241	12.892	13.00	11 1/2		
5	5.250	4.648	.301	15.909	16.00	11 1/2		
5 3/16	5.500	5.192	.154	8.792	9.00	14	1.292	5.698
5 3/16	5.500	5.044	.228	12.837	13.00	11 1/2		
5 3/16	5.500	4.892	.304	16.870	17.00	11 1/2		
5 5/8	6.000	5.672	.164	10.222	10.50	14	1.342	6.218
5 5/8	6.000	5.620	.190	11.789	12.00	11 1/2		
5 5/8	6.000	5.552	.224	13.818	14.00	11 1/2		
5 5/8	6.000	5.450	.275	16.814	17.00	11 1/2		
6 1/4	6.625	6.287	.169	11.652	12.00	14	1.405	6.853
6 1/4	6.625	6.255	.185	12.724	13.00	14		
6 1/4	6.625	6.257	.184	12.657	13.00	11 1/2		
6 1/4	6.625	6.135	.245	16.694	17.00	11 1/2		
6 1/4	6.625	5.913	.356	23.835	24.00	11 1/2		
6 5/8	7.000	6.652	.174	12.685	13.00	14	1.442	7.238
6 5/8	7.000	6.538	.231	16.699	17.00	11 1/2		
6 5/8	7.000	6.538	.231	16.699	17.00	10		
6 5/8	7.000	6.450	.275	19.751	20.00	10		
6 5/8	7.000	6.334	.333	23.711	24.00	10		
7 1/4	7.625	7.263	.181	14.390	14.75	14	1.505	7.877
7 5/8	8.000	7.628	.186	15.522	16.00	11 1/2	1.573	8.238
7 5/8	8.000	7.528	.236	19.569	20.00	11 1/2		
8 1/4	8.625	8.249	.188	16.940	17.50	11 1/2	1.636	8.867
8 1/4	8.625	8.191	.217	19.486	20.00	11 1/2		
8 1/4	8.625	8.097	.264	23.574	24.00	11 1/2		
8 1/4	8.625	8.097	.264	23.574	24.00	8		
8 1/4	8.625	8.003	.311	27.615	28.00	8		
8 5/8	9.000	8.608	.196	18.429	19.00	11 1/2	1.673	9.258
9 5/8	10.000	9.582	.209	21.855	22.75	11 1/2	1.773	10.284
9 5/8	10.000	9.434	.283	29.369	30.25	11 1/2		
10	10.750	10.192	.279	31.201	32.51	8		
10	10.750	10.146	.302	33.699	35.00	8		
10 5/8	11.000	10.552	.224	25.780	26.75	11 1/2	1.873	11.314
11 5/8	12.000	11.514	.243	30.512	31.50	11 1/2	1.973	12.352
12 1/2	13.000	12.482	.259	35.243	36.50	11 1/2	2.073	13.384
12 1/2	13.000	12.278	.361	48.730	50.00	8		
13 1/2	14.000	13.448	.276	40.454	42.00	11 1/2	2.173	14.418
14 1/2	15.000	14.418	.291	45.714	47.50	11 1/2	2.273	15.448
15 1/2	16.000	15.396	.302	50.632	52.50	11 1/2	2.373	16.470

FOR LIST PRICES, SEE LATEST PIPE CARD

SEAMLESS DRAWN BRASS AND COPPER TUBING

IRON PIPE SIZES

Size Inches	Size Millimeters	Dimensions		Approximate Weights	
		Inside Diameter Inches	Outside Diameter Inches	Brass CODE: RESPERGITO Per Lineal Foot Pounds	Copper CODE: RESPICATUR Per Lineal Foot Pounds
1/8	3	.281	.405	.25	.26
1/4	6	.375	.540	.43	.45
3/8	10	.494	.675	.62	.65
1/2	13	.625	.840	.90	.95
3/4	19	.822	1.05	1.25	1.31
1	25	1.062	1.315	1.70	1.79
1 1/4	32	1.368	1.66	2.50	2.63
1 1/2	38	1.600	1.90	3.00	3.15
2	50	2.062	2.375	4.00	4.20
2 1/2	64	2.500	2.875	5.75	6.04
3	76	3.062	3.50	8.30	8.72
3 1/2	90	3.500	4.00	10.90	11.45
4	100	4.000	4.50	12.70	13.33
4 1/2	113	4.500	5.00	13.90	14.60
5	125	5.062	5.563	15.75	16.54
6	150	6.125	6.625	18.31	19.23
7	175	7.062	7.625	26.28	27.60
8	200	7.982	8.625	29.88	31.37

EXTRA HEAVY

				Brass CODE: RESPONDEAM	Copper CODE: RESPUEMUS
1/8	3	.205	.405	.370	.388
1/4	6	.294	.540	.625	.650
3/8	10	.421	.675	.830	.870
1/2	13	.542	.840	1.200	1.33
3/4	19	.736	1.050	1.660	1.75
1	25	.951	1.315	2.360	2.478
1 1/4	32	1.272	1.660	3.300	3.465
1 1/2	38	1.494	1.900	4.250	4.462
2	50	1.933	2.375	5.460	5.733
2 1/2	64	2.315	2.875	8.300	8.715
3	76	2.892	3.500	11.200	11.760
3 1/2	90	3.358	4.00	13.700	14.385
4	100	3.818	4.50	16.500	17.325
5	125	4.813	5.563	22.800	23.940
6	150	5.750	6.625	32.000	33.600

Furnished with plain ends, unless otherwise specified. Commercial lengths are 12 feet long. 18 foot lengths can be made up on order.

PRICES ON APPLICATION.

GAUGE TUBING

Price of seamless or brazed tubing, of diameters 1/8 inch to 10 inch and any gauge in which the different diameters are made, will be quoted on request, for direct shipment from mill.

CAST IRON FLANGED PIPE

CODE: RINOMINAVI

TABLE OF STANDARD DIMENSIONS

Nominal Diameter Inches	Nominal Diameter Millimeters	Diameter of Flange Inches	Diameter of Bolt Circle, Inches	Number of Bolts	Diameter of Bolts Inches	Class A 100 Foot Head 43 Pounds Pressure				Class B 200 Foot Head 86 Pounds Pressure				Class C 300 Foot Head 130 Pounds Pressure				Class D 400 Foot Head 173 Pounds Pressure			
						Th'k-ness	Weight, Pounds per			Th'k-ness	Weight, Pounds per			Th'k-ness	Weight, Pounds per			Th'k-ness	Weight, Pounds per		
						Ins.	Foot	Length	Single Flange	Ins.	Foot	Length	Single Flange	Ins.	Foot	Length	Single Flange	Ins.	Foot	Length	Single Flange
3	76	7.50	6.00	4	5/8	.39	13.0	168	5.8	.42	14.6	188	6.3	.45	15.5	199	6.6	.48	16.4	211	7.1
4	100	9.00	7.50	8	5/8	.42	18.0	234	9.0	.45	20.1	259	9.1	.48	21.3	275	9.7	.52	22.8	295	10.4
6	150	11.00	9.50	8	3/4	.44	27.9	358	11.8	.48	31.1	398	12.3	.51	32.9	421	12.8	.55	35.3	451	13.7
8	200	13.50	11.75	8	3/4	.46	38.7	498	16.9	.51	42.7	549	18.2	.56	48.0	614	19.0	.60	51.2	654	20.1
10	250	16.00	14.25	12	7/8	.50	51.9	671	23.9	.57	58.8	759	26.6	.62	65.5	840	27.3	.68	71.4	916	29.6
12	300	19.00	17.00	12	7/8	.54	67.0	876	35.8	.62	76.4	998	40.4	.68	85.4	1109	42.0	.75	93.7	1216	45.6
14	350	21.00	18.75	12	1	.57	82.3	1070	41.4	.66	94.7	1231	47.3	.74	108.1	1397	49.6	.82	119.2	1539	54.5
16	400	23.50	21.25	16	1	.60	98.8	1290	52.5	.70	114.6	1495	60.1	.80	133.3	1727	63.9	.89	147.5	1910	70.2
18	450	25.00	22.75	16	1 1/8	.64	118.3	1528	54.5	.75	137.8	1779	62.5	.87	162.4	2083	66.9	.96	178.4	2287	73.4
0	500	27.50	25.00	20	1 3/8	.67	137.4	1783	66.8	.80	163.1	2114	78.7	.92	190.6	2454	83.3	1.03	212.3	2731	92.1
4	600	32.00	29.50	20	1 1/4	.76	186.5	2424	92.9	.89	217.3	2821	106.8	1.04	257.6	3321	114.7	1.16	286.0	3686	126.9
30	750	38.75	36.00	28	1 3/8	.88	266.1	3486	146.1	1.03	312.6	4077	162.9	1.20	366.9	4759	178.1	1.37	421.2	5436	191.0
36	900	46.00	42.75	32	1 1/2	.99	358.7	4748	221.9	1.15	418.7	5514	245.2	1.36	497.7	6519	273.3	1.58	581.9	7577	296.8
40	1000	50.75	47.25	36	1 5/8	1.06	427.2	5684	279.1	1.23	497.0	6586	311.2	1.48	601.6	7921	350.7	1.72	703.4	9203	389.0
42	1050	53.00	49.50	36	1 5/8	1.10	464.6	6195	310.0	1.28	542.2	7198	346.1	1.54	657.4	8660	385.3	1.78	764.1	10004	417.5
48	1200	59.50	56.00	44	1 5/8	1.26	608.0	8112	408.1	1.42	687.2	9132	442.9	1.71	832.7	10979	493.4	1.96	960.8	12578	524.3

CONTINUED ON FOLLOWING PAGE

CAST IRON FLANGED PIPE

(CONTINUED)

TABLE OF STANDARD DIMENSIONS

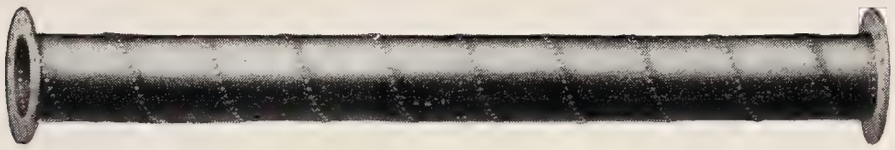
Nominal Diameter Inches	Nominal Diameter Millimeters	Diameter of Flange Inches	Diameter of Bolt Circle, Inches	Number of Bolts	Diameter of Bolts Inches	Class E 500 Foot Head 217 Pounds Pressure				Class F 600 Foot Head 260 Pounds Pressure				Class G 700 Foot Head 304 Pounds Pressure				Class H 800 Foot Head 347 Pounds Pressure			
						Th'k-ness	Weight, Pounds per			Th'k-ness	Weight, Pounds per			Th'k-ness	Weight, Pounds per			Th'k-ness	Weights, Pounds per		
						Ins.	Foot	Length	Single Flange	Ins.	Foot	Length	Single Flange	Ins.	Foot	Length	Single Flange	Ins.	Foot	Length	Single Flange
6	150	12.50	10.63	12	¾	.58	37.7	495	21.3	.61	39.5	519	22.2	.65	42.9	560	22.9	.69	45.2	591	24.1
8	200	15.00	13.00	12	⅞	.66	54.7	718	31.2	.71	60.6	794	33.1	.75	65.1	849	33.9	.80	68.8	897	36.0
10	250	17.50	15.25	16	1	.74	78.8	1032	43.5	.80	84.7	1109	46.5	.86	92.5	1207	47.9	.92	98.5	1284	51.0
12	300	20.50	17.75	16	1⅛	.82	104.2	1378	64.0	.89	112.4	1487	68.7	.97	124.6	1639	71.6	1.04	132.9	1748	76.4
14	350	23.00	20.25	20	1⅛	.90	133.1	1762	82.7	.99	146.2	1935	90.0	1.07	160.2	2108	92.8	1.16	172.6	2271	100.0
16	400	25.50	22.50	20	1¼	.98	165.0	2192	106.0	1.08	180.8	2398	114.2	1.18	199.2	2627	118.6	1.27	215.0	2834	127.1
18	450	28.00	24.75	24	1¼	1.07	202.3	2680	126.3	1.17	219.8	2915	138.8	1.28	244.6	3230	147.1	1.39	264.1	3488	159.0
20	500	30.50	27.00	24	1⅜	1.15	241.1	3200	153.4	1.27	262.5	3487	168.3	1.39	294.4	3894	180.7	1.51	318.3	4210	195.4
24	600	36.00	32.00	24	1⅝	1.31	328.5	4431	244.3	1.45	361.6	4877	268.9	1.75	446.2	5413	295.0	1.88	476.9	6355	316.0
30	750	43.00	39.25	28	1¾	1.55	484.7	6534	358.5	1.73	538.0	7265	405.2								
36	900	50.00	46.00	32	1⅞	1.80	674.2	9167	538.5	2.02	748.7	10040	577.8								

PRICES ON APPLICATION

NOTE.—Thickness of flange equals approximately 1½ times thickness of pipe plus ⅛-inch. Flanges drilled to "American 1914 Standard" Templates; send template if other drilling is required. Bolt holes drilled ⅛-inch larger than bolts. All dimensions in inches. Pipe made in 12-foot lengths and faced 1/16-inch short for gaskets; special short lengths made to order. Above are neat finished weights. Allowance must be made for variation and finish. All weights are approximate.

STANDARD WEIGHT

SPIRAL RIVETED PRESSURE PIPE



PRICES ON APPLICATION

CODE: RINVISPOLO

Inside Diameter Inches	Dimensions and Weight		
	Approximate Weight per Foot Asphalted Pounds	Thickness U. S. Standard Gauge	Diameter of Flanges Inches
3	2.3	18	6
4	3.7	16	7
5	4.5	16	8
6	5.3	16	9
7	6.2	16	10
8	7.1	16	11
9	8.0	16	13
10	8.8	16	14
11	9 7	16	15
12	10.6	16	16
13	14.1	14	17
14	15.9	14	18
15	17.0	14	19
16	18.1	14	21¼
18	19.9	14	23¼
20	22.1	14	25¼
22	33.7	12	28¼
24	36.5	12	30
26	39.5	12	32
28	51.7	10	34
30	56.8	10	36
32	61.6	10	38
34	65.4	10	40
36	69.1	10	42
38	73.2	10	44
40	76.7	10	46
42	80.9	10	48

Spiral Riveted Pipe is usually furnished in 20-foot lengths. Shorter lengths can be furnished.

The flanges on this pipe are forged steel, and of special dimensions adopted by the Riveted Pipe Manufacturers. The dimensions and drilling templates do not conform to those of the American Standard. We can, however, furnish flanges according to the American Standard dimensions and drilling, at an extra price.

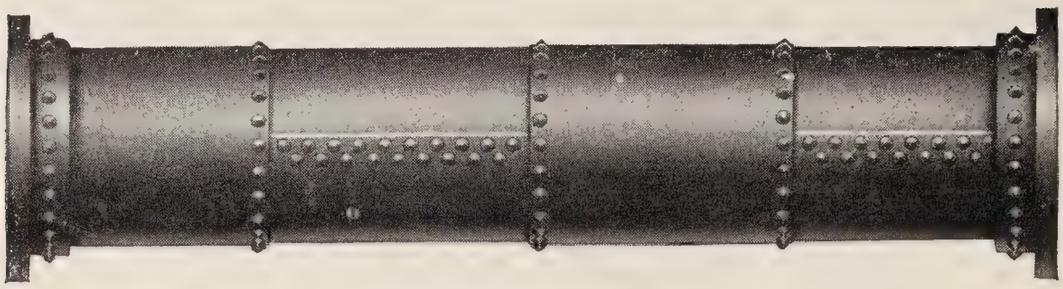
Flanges are always attached to the pipe at the factory, and can not be put on readily by the user, as the pipe is either asphalted or galvanized after the flanges are attached.

Galvanized Pipe only is recommended for use as Exhaust Steam Pipe.

We supply Extra Heavy and Double Extra Heavy Spiral Riveted Pipe for High Pressure Water Mains, Hydraulic Work, Vacuum Pipe Service, etc.

STRAIGHT SEAM STEEL RIVETED PIPE

FOR EXHAUST STEAM AND WATER PIPE LINES



CODE: RIPESCHINO

PRICES ON APPLICATION

Inside Diameter of Pipe, Inches	Thickness of Material U.S.Standard Gauge	Equivalent Thickness in Inches	Theoretical Safe Working Head, Feet	Approximate Weight per Lineal Foot Pounds	Inside Diameter of Pipe, Inches	Thickness of Material U.S. Standard Gauge	Equivalent Thickness in Inches	Theoretical Safe Working Head, Feet	Approximate Weight per Lineal Foot Pounds
16	16	.062	190	13.00	24	6	.200	405	59.00
16	14	.078	237	16.00	26	14	.078	145	25.50
16	12	.109	332	22.25	26	12	.109	203	35.50
16	11	.125	379	24.50	26	11	.125	233	39.50
16	10	.140	425	28.50	26	10	.140	261	44.25
18	16	.062	168	14.75	26	8	.171	319	54.00
18	14	.078	210	18.50	26	6	.200	373	64.00
18	12	.109	295	25.25	28	14	.078	135	27.25
18	11	.125	337	29.00	28	12	.109	188	38.00
18	10	.140	378	32.50	28	11	.125	216	42.25
18	8	.171	460	40.00	28	10	.140	242	47.50
20	16	.062	151	16.00	28	8	.171	295	58.00
20	14	.078	189	19.75	28	6	.200	346	69.00
20	12	.109	265	27.50	30	12	.109	176	39.50
20	11	.125	304	31.50	30	11	.125	202	45.00
20	10	.140	340	35.00	30	10	.140	226	50.50
20	8	.171	415	45.50	30	8	.171	276	61.75
22	16	.062	138	17.75	30	6	.200	323	73.00
22	14	.078	172	22.00	30	1/4	.250	404	90.00
22	12	.109	240	30.50	36	11	.125	168	54.00
22	11	.125	276	34.50	36	10	.140	189	60.50
22	10	.140	309	39.00	36	3/16	.187	252	81.00
22	8	.171	376	50.00	36	1/4	.250	337	109.00
24	14	.078	158	23.75	36	5/16	.312	420	135.00
24	12	.109	220	32.00	40	3/16	.187	226	90.00
24	11	.125	253	37.50	40	1/4	.250	303	120.00
24	10	.140	283	42.00	40	5/16	.312	378	150.00
24	8	.171	346	50.00	40	3/8	.375	455	180.00

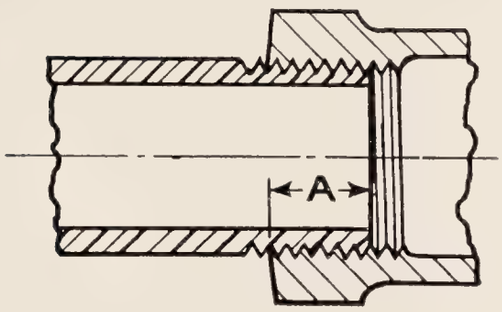
The safe working heads given in above table are theoretical, and based on ordinary working conditions. Judgment should be used in arriving at the practical safe working heads, due allowance being made for possible water hammer, settling, and the expansion and contraction of pipe, and causes which would tend to collapse same. The working heads, are based on the longitudinal seams being double riveted and the circumferential seams single riveted.

We can furnish end flanges made from the following materials: Cast Iron, Ferrosteel, Forged Steel and Malleable Iron. Where the service is light, we can also furnish Pressed Steel Flanges with diameters and drilling similar to those adopted by the Riveted Steel Pipe Manufacturers.

When ordering, always cover fully the following points: Whether pipe is used for steam or water; maximum working pressure; material flanges are to be made of; and if painted or plain.

LENGTH OF THREAD ON PIPE

THAT IS SCREWED INTO VALVES OR FITTINGS TO MAKE A TIGHT JOINT



Size Inches	Size Millimeters	Dimension A Inches	Size Inches	Size Millimeters	Dimension A Inches
1/8	3	1/4	3 1/2	90	1 1/16
1/4	6	3/8	4	100	1 1/16
3/8	10	3/8	4 1/2	113	1 1/8
1/2	13	1/2	5	125	1 3/16
3/4	19	1/2	6	150	1 1/4
1	25	9/16	7	175	1 1/4
1 1/4	32	5/8	8	200	1 5/16
1 1/2	38	5/8	9	225	1 3/8
2	50	11/16	10	250	1 1/2
2 1/2	64	15/16	12	300	1 5/8
3	76	1			

DIMENSIONS GIVEN DO NOT ALLOW FOR VARIATION IN TAPPING OR THREADING

For length of thread on pipe screwed into Railing Fittings, see page 341.

STANDARD

WROUGHT PIPE

TABLE OF STANDARD DIMENSIONS

Size	Size	Diameters		Nominal Thickness	Circumference		Transverse Areas			Length of Pipe Per Sq. Foot of		Length of Pipe Containing One Cubic Foot	Nominal Weight Per Foot		Number of Threads per Inch of Screw
Inches	Millimeters	External Inches	Approximate Internal Inches	Inches	External Inches	Internal Inches	External Sq. Ins.	Internal Sq. Ins.	Metal Sq. Ins.	External Surface Feet	Internal Surface Feet	Feet	Plain Ends	Threaded and Coupled	
1/8	3	.405	.269	.068	1.272	.845	.129	.057	.072	9.431	14.199	2533.775	.244	.245	27
1/4	6	.540	.364	.088	1.696	1.144	.229	.104	.125	7.073	10.493	1383.789	.424	.425	18
3/8	10	.675	.493	.091	2.121	1.549	.358	.191	.167	5.658	7.747	754.360	.567	.568	18
1/2	13	.840	.622	.109	2.639	1.954	.554	.304	.250	4.547	6.141	473.906	.850	.852	14
3/4	19	1.050	.824	.113	3.299	2.589	.866	.533	.333	3.637	4.635	270.034	1.130	1.134	14
1	25	1.315	1.049	.133	4.131	3.296	1.358	.864	.494	2.904	3.641	166.618	1.678	1.684	11 1/2
1 1/4	32	1.660	1.380	.140	5.215	4.335	2.164	1.495	.669	2.301	2.767	96.275	2.272	2.281	11 1/2
1 1/2	38	1.900	1.610	.145	5.969	5.058	2.835	2.036	.799	2.010	2.372	70.733	2.717	2.731	11 1/2
2	50	2.375	2.067	.154	7.461	6.494	4.430	3.355	1.075	1.608	1.847	42.913	3.652	3.678	11 1/2
2 1/2	64	2.875	2.469	.203	9.032	7.757	6.492	4.788	1.704	1.328	1.547	30.077	5.793	5.819	8
3	76	3.500	3.068	.216	10.996	9.638	9.621	7.393	2.228	1.091	1.245	19.479	7.575	7.616	8

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CONTINUED FROM OPPOSITE PAGE

3½	90	4.000	3.548	.226	12.566	11.146	12.566	9.886	2.680	.954	1.076	14.565	9.109	9.202	8
4	100	4.500	4.026	.237	14.137	12.648	15.904	12.730	3.174	.848	.948	11.312	10.790	10.889	8
4½	113	5.000	4.506	.247	15.708	14.156	19.635	15.947	3.688	.763	.847	9.030	12.538	12.642	8
5	125	5.563	5.047	.258	17.477	15.856	24.306	20.006	4.300	.686	.756	7.198	14.617	14.810	8
6	150	6.625	6.065	.280	20.813	19.054	34.472	28.891	5.581	.576	.629	4.984	18.974	19.185	8
7	175	7.625	7.023	.301	23.955	22.063	45.664	38.738	6.926	.500	.543	3.717	23.544	23.769	8
8	200	8.625	8.071	.277	27.096	25.356	58.426	51.161	7.265	.442	.473	2.815	24.696	25.000	8
8	200	8.625	7.981	.322	27.096	25.073	58.426	50.027	8.399	.442	.478	2.878	28.554	28.809	8
9	225	9.625	8.941	.342	30.238	28.089	72.760	62.786	9.974	.396	.427	2.294	33.907	34.188	8
10	250	10.750	10.192	.279	33.772	32.019	90.763	81.585	9.178	.355	.374	1.765	31.201	32.000	8
10	250	10.750	10.136	.307	33.772	31.843	90.763	80.691	10.072	.355	.376	1.785	34.240	35.000	8
10	250	10.750	10.020	.365	33.772	31.479	90.763	78.855	11.908	.355	.381	1.826	40.483	41.132	8
11	275	11.750	11.000	.375	36.914	34.558	108.434	95.033	13.401	.325	.347	1.515	45.557	46.247	8
12	300	12.750	12.090	.330	40.055	37.982	127.676	114.800	12.876	.299	.315	1.254	43.773	45.000	8
12	300	12.750	12.000	.375	40.055	37.699	127.676	113.097	14.579	.299	.318	1.273	49.562	50.706	8

FOR LARGE O. D. PIPE, SEE PAGE 570

FOR LIST PRICES, SEE PAGE 569. FOR DESCRIPTION OF TESTS, SEE PAGE 567

EXTRA STRONG WROUGHT PIPE

TABLE OF STANDARD DIMENSIONS

Diameter				Nominal Thickness	Circumference		Transverse Areas			Length of Pipe per Square Foot of		Length of Pipe Containing One Cubic Foot	Nominal Weight per Foot Plain Ends
Nominal Internal	Nominal Internal	External	Approximate Internal Diameter		External	Internal	External	Internal	Metal	External Surface	Internal Surface		
Inches	Millimeters	Inches	Inches	Inches	Inches	Inches	Sq. Inches	Sq. Inches	Sq. Inches	Feet	Feet	Feet	Pounds
1/8	3	.405	.215	.095	1.272	.675	.129	.036	.093	9.431	17.766	3966.392	.314
1/4	6	.540	.302	.119	1.696	.949	.229	.072	.157	7.073	12.648	2010.290	.535
3/8	10	.675	.423	.126	2.121	1.329	.358	.141	.217	5.658	9.030	1024.689	.738
1/2	13	.840	.546	.147	2.639	1.715	.554	.234	.320	4.547	6.995	615.017	1.087
3/4	19	1.050	.742	.154	3.299	2.331	.866	.433	.433	3.637	5.147	333.016	1.473
1	25	1.315	.957	.179	4.131	3.007	1.358	.719	.639	2.904	3.991	200.193	2.171
1 1/4	32	1.660	1.278	.191	5.215	4.015	2.164	1.283	.881	2.301	2.988	112.256	2.996
1 1/2	38	1.900	1.500	.200	5.969	4.712	2.835	1.767	1.068	2.010	2.546	81.487	3.631
2	50	2.375	1.939	.218	7.461	6.092	4.430	2.953	1.477	1.608	1.969	48.766	5.022
2 1/2	64	2.875	2.323	.276	9.032	7.298	6.492	4.238	2.254	1.328	1.644	33.976	7.661
3	76	3.500	2.900	.300	10.996	9.111	9.621	6.605	3.016	1.091	1.317	21.801	10.252
3 1/2	90	4.000	3.364	.318	12.566	10.568	12.566	8.888	3.678	.954	1.135	16.202	12.505
4	100	4.500	3.826	.337	14.137	12.020	15.904	11.497	4.407	.848	.998	12.525	14.983
4 1/2	113	5.000	4.290	.355	15.708	13.477	19.635	14.455	5.180	.763	.890	9.962	17.611
5	125	5.563	4.813	.375	17.477	15.120	24.306	18.194	6.112	.686	.793	7.915	20.778
6	150	6.625	5.761	.432	20.813	18.099	34.472	26.067	8.405	.576	.663	5.524	28.573
7	175	7.625	6.625	.500	23.955	20.813	45.664	34.472	11.192	.500	.576	4.177	38.048
8	200	8.625	7.625	.500	27.096	23.955	58.426	45.663	12.763	.442	.500	3.154	43.388
9	225	9.625	8.625	.500	30.238	27.096	72.760	58.426	14.334	.396	.442	2.464	48.728
10	250	10.750	9.750	.500	33.772	30.631	90.763	74.662	16.101	.355	.391	1.929	54.735
11	275	11.750	10.750	.500	36.914	33.772	108.434	90.763	17.671	.325	.355	1.587	60.075
12	300	12.750	11.750	.500	40.055	36.914	127.676	108.434	19.242	.299	.325	1.328	65.415

FOR LIST PRICES, SEE PAGE 569. FOR DESCRIPTION OF TESTS, SEE PAGE 567.

DOUBLE EXTRA STRONG WROUGHT PIPE

TABLE OF STANDARD DIMENSIONS

Diameter				Nominal Thickness	Circumference		Transverse Areas			Length of Pipe per Square Foot of		Length of Pipe Containing One Cubic Foot	Nominal Weight per Foot Plain Ends
Nominal Internal	Nominal Internal	External	Approximate Internal Diameter		External	Internal	External	Internal	Metal	External Surface	Internal Surface		
Inches	Millimeters	Inches	Inches	Inches	Inches	Inches	Sq. Inches	Sq. Inches	Sq. Inches	Feet	Feet	Feet	Pounds
½	13	.840	.252	.294	2.639	.792	.554	.050	.504	4.547	15.157	2887.164	1.714
¾	19	1.050	.434	.308	3.299	1.363	.866	.148	.718	3.637	8.801	973.404	2.440
1	25	1.315	.599	.358	4.131	1.882	1.358	.282	1.076	2.904	6.376	510.998	3.659
1¼	32	1.660	.896	.382	5.215	2.815	2.164	.630	1.534	2.301	4.263	228.379	5.214
1½	38	1.900	1.100	.400	5.969	3.456	2.835	.950	1.885	2.010	3.472	151.526	6.408
2	50	2.375	1.503	.436	7.461	4.722	4.430	1.774	2.656	1.608	2.541	81.162	9.029
2½	64	2.875	1.771	.552	9.032	5.564	6.492	2.464	4.028	1.328	2.156	58.457	13.695
3	76	3.500	2.300	.600	10.996	7.226	9.621	4.155	5.466	1.091	1.660	34.659	18.583
3½	90	4.000	2.728	.636	12.566	8.570	12.566	5.845	6.721	.954	1.400	24.637	22.850
4	100	4.500	3.152	.674	14.137	9.902	15.904	7.803	8.101	.848	1.211	18.454	27.541
4½	113	5.000	3.580	.710	15.708	11.247	19.635	10.066	9.569	.763	1.066	14.306	32.530
5	125	5.563	4.063	.750	17.477	12.764	24.306	12.966	11.340	.686	.940	11.107	38.552
6	150	6.625	4.897	.864	20.813	15.384	34.472	18.835	15.637	.576	.780	7.646	53.160
7	175	7.625	5.875	.875	23.955	18.457	45.664	27.109	18.555	.500	.650	5.312	63.079
8	200	8.625	6.875	.875	27.096	21.598	58.426	37.122	21.304	.442	.555	3.879	72.424

Note—Sizes 3½ inch and larger are made by telescoping. For pipe 9 inch and larger, see page 570.

FOR LIST PRICES, SEE PAGE 569. FOR DESCRIPTION OF TESTS, SEE PAGE 567

STANDARD BOILER TUBES

TABLE OF STANDARD DIMENSIONS

Diameter		Nominal Thickness	Nearest B Wire Gauge	Circumference		Transverse Areas			Length of Tube per Square Foot of		Nominal Weight per Foot
External	Internal			External	Internal	External	Internal	Metal	External Surface	Internal Surface	
Inches	Inches	Inches	No.	Inches	Inches	Sq. Inches	Sq. Inches	Sq. Inches	Feet	Feet	Pounds
1¾	1.560	.095	13	5.498	4.901	2.405	1.911	.494	2.182	2.448	1.679
2	1.810	.095	13	6.283	5.686	3.142	2.573	.569	1.909	2.110	1.932
2¼	2.060	.095	13	7.069	6.472	3.976	3.333	.643	1.697	1.854	2.186
2½	2.282	.109	12	7.854	7.169	4.909	4.090	.819	1.527	1.673	2.783
2¾	2.532	.109	12	8.639	7.955	5.940	5.036	.904	1.388	1.508	3.074
3	2.782	.109	12	9.425	8.740	7.069	6.079	.990	1.273	1.373	3.365
3¼	3.010	.120	11	10.210	9.456	8.296	7.116	1.180	1.175	1.269	4.011
3½	3.260	.120	11	10.996	10.242	9.621	8.347	1.274	1.091	1.171	4.331
3¾	3.510	.120	11	11.781	11.027	11.045	9.677	1.368	1.018	1.088	4.652
4	3.732	.134	10	12.566	11.724	12.566	10.939	1.627	.954	1.023	5.532
4½	4.232	.134	10	14.137	13.295	15.904	14.066	1.838	.848	.902	6.248
5	4.704	.148	9	15.708	14.778	19.635	17.379	2.256	.763	.812	7.669

CONTINUED ON FOLLOWING PAGE

STANDARD BOILER TUBES—CONTINUED

TABLE OF STANDARD DIMENSIONS

Diameter		Nominal Thickness	Nearest B Wire Gauge	Circumference		Transverse Areas			Length of Tube per Square Foot of		Nominal Weight per Foot
External	Internal			External	Internal	External	Internal	Metal	External Surface	Internal Surface	
Inches	Inches	Inches	No.	Inches	Inches	Sq. Inches	Sq. Inches	Sq. Inches	Feet	Feet	Pounds
6	5.670	.165	8	18.850	17.813	28.274	25.249	3.025	.636	.673	10.282
7	6.670	.165	8	21.991	20.954	38.485	34.942	3.543	.545	.572	12.044
8	7.670	.165	8	25.133	24.096	50.265	46.204	4.061	.477	.498	13.807
9	8.640	.180	7	28.274	27.143	63.617	58.629	4.988	.424	.442	16.955
10	9.594	.203	6	31.416	30.140	78.540	72.292	6.248	.381	.398	21.240
11	10.560	.220	5	34.558	33.175	95.033	87.582	7.451	.347	.361	25.329
12	11.542	.229	—	37.699	36.260	113.097	104.629	8.468	.318	.330	28.788
13	12.524	.238	4	40.840	39.345	132.732	123.190	9.542	.293	.304	32.439

Note.—In estimating effective steam-heating or evaporating surface of tubes, the surface in contact with air or gasses of combustion, according to manner of application, as whether internal or external, is to be thus taken. For heating liquids by steam, superheating steam, or transferring heat from one liquid or one gas to another, mean surface of tubes to be computed.

FOR LIST ON BOILER TUBES, SEE LATEST PIPE CARD

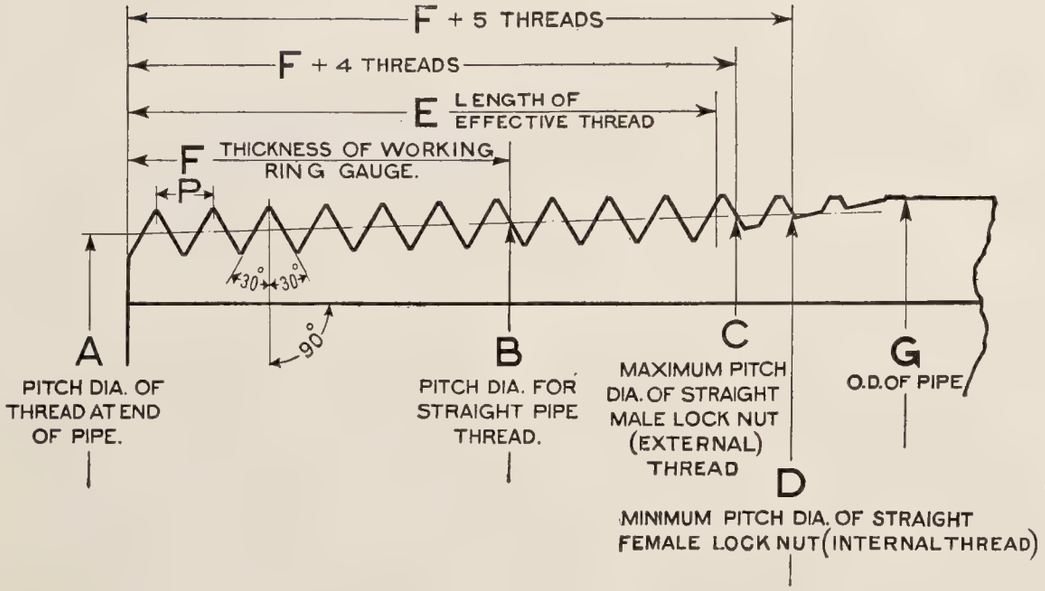
FOR LOCOMOTIVE TUBES, SUBMIT SPECIFICATIONS

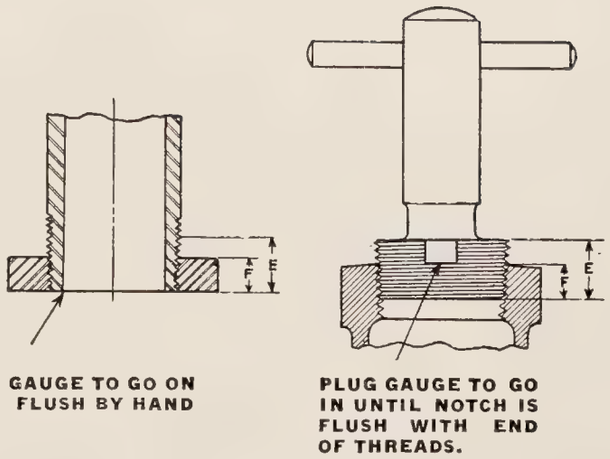
Boiler Tubes to conform to the A. S. M. E. Boiler Code must be so ordered.

Most boiler tubes are now made to conform to the A. S. M. E. Boiler Code, which requires that the gauge ordered is the lightest that can be furnished, so that tubes made to this specification will average heavier and of smaller internal diameter than given above.

AMERICAN STANDARD

FOR TAPER AND STRAIGHT PIPE THREADS AND LOCKNUT THREADS





GAUGE TO GO ON FLUSH BY HAND

PLUG GAUGE TO GO IN UNTIL NOTCH IS FLUSH WITH END OF THREADS.

TOLERANCE FOR MALE THREADS:
One Turn Large (max. size), One Turn Small (min. size), from face of Ring Gauge.

TOLERANCE FOR FEMALE THREADS:
One Turn Large (max. size), One Turn Small (min. size), from Gauging Notch.

A equals G $-(0.05G+1.1)P$
B equals A $+ .0625F$
C equals B $+ (4P \times .0625)$
D equals B $+ (5P \times .0625)$

E equals $(0.8G + 6.8)$ P
F equals thickness of Working Ring Gauge.
P equals Pitch
Total Taper $\frac{3}{4}$ inch per foot.
Depth of Thread 0.8P.

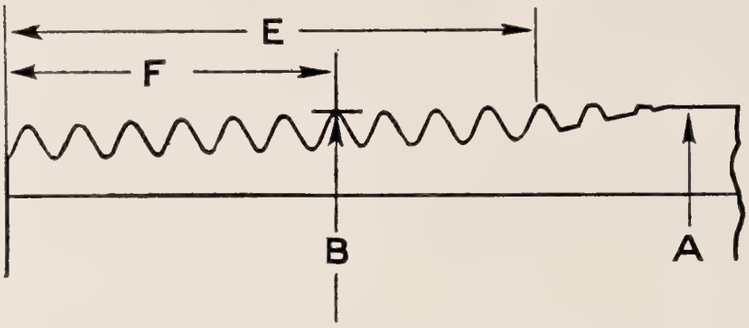
AMERICAN STANDARD

FOR TAPER AND STRAIGHT PIPE THREADS AND LOCKNUT THREADS

(CONTINUED)

Size	A	B	C	D	E	F	G	Depth of Thread	Pitch of Thread	Threads per inch
⅛	.36351	.37476	.38402	.38633	.2638	.180	.405	.02963	.03704	27
¼	.47739	.48989	.50378	.50725	.4018	.200	.540	.04444	.05556	18
⅜	.61201	.62701	.64090	.64437	.4078	.240	.675	.04444	.05556	18
½	.75843	.77843	.79628	.80075	.5337	.320	.840	.05714	.07143	14
¾	.96768	.98886	1.00672	1.01118	.5457	.339	1.050	.05714	.07143	14
1	1.21363	1.23863	1.26037	1.26580	.6828	.400	1.315	.06956	.08696	11½
1¼	1.55713	1.58338	1.60512	1.61055	.7068	.420	1.660	.06956	.08696	11½
1½	1.79609	1.82234	1.84407	1.84951	.7235	.420	1.900	.06956	.08696	11½
2	2.26902	2.29627	2.31801	2.32344	.7565	.436	2.375	.06956	.08696	11½
2½	2.71953	2.76216	2.79341	2.80122	1.1375	.682	2.875	.100	.12500	8
3	3.34063	3.38850	3.41975	3.42756	1.2000	.766	3.500	.100	.12500	8
3½	3.83750	3.88881	3.92006	3.92787	1.2500	.821	4.000	.100	.12500	8
4	4.33438	4.38713	4.41838	4.42619	1.3000	.844	4.500	.100	.12500	8
4½	4.83125	4.88594	4.91719	4.92500	1.3500	.875	5.000	.100	.12500	8
5	5.39073	5.44929	5.48054	5.48836	1.4063	.937	5.563	.100	.12500	8
6	6.44609	6.50597	6.53722	6.54503	1.5125	.958	6.625	.100	.12500	8
7	7.43984	7.50234	7.53359	7.54141	1.6125	1.000	7.625	.100	.12500	8
8	8.43359	8.50003	8.53128	8.53909	1.7125	1.063	8.625	.100	.12500	8
9	9.42734	9.49797	9.52922	9.53703	1.8125	1.130	9.625	.100	.12500	8
10	10.54531	10.62094	10.65219	10.66000	1.9250	1.210	10.750	.100	.12500	8
11	11.53906	11.61938	11.65063	11.65844	2.0250	1.285	11.750	.100	.12500	8
12	12.53281	12.61781	12.64906	12.65688	2.1250	1.360	12.750	.100	.12500	8
14 O. D.	13.77500	13.87262	13.90387	13.91168	2.250	1.562	14.00	.100	.12500	8
15 O. D.	14.76875	14.87419	14.90543	14.91324	2.350	1.687	15.00	.100	.12500	8
16 O. D.	15.76250	15.87575	15.90700	15.91481	2.450	1 812	16.00	.100	.12500	8
17 O. D.	16.75625	16.87500	16.90625	16.91406	2.550	1.900	17.00	.100	.12500	8
18 O. D.	17.75000	17.87500	17.90625	17.91406	2.650	2.000	18.00	.100	.12500	8
20 O. D.	19.73750	19.87031	19.90156	19.90937	2.850	2.125	20.00	.100	.12500	8
22 O. D.	21.72500	21.86562	21.89687	21.90468	3.050	2.250	22.00	.100	.12500	8
24 O. D.	23.71250	23.86094	23.89218	23.89999	3.250	2.375	24.00	.100	.12500	8

BRITISH STANDARD PIPE THREADS



SCHEDULE OF SIZES

Whitworth 55° Form of Thread.

Total taper ¾ inch per foot

Nominal Bore of Pipe Inches	A Approximate Outside Diameter of Pipe Inches	B Gauge Diameter Top of Thread Inches	Single Depth of Thread Inches	Number of Threads Per Inch	E Length of Thread on Pipe End Inches	F Distance of Gauge Diameter From End of Pipe Inches
1/8	13/32	.383	.0230	28	3/8	5/32
1/4	17/32	.518	.0335	19	7/16	3/16
3/8	11/16	.656	.0335	19	1/2	1/4
1/2	27/32	.825	.0455	14	5/8	1/4
5/8	15/16	.902	.0455	14	5/8	1/4
3/4	1 1/16	1.041	.0455	14	3/4	3/8
7/8	1 17/32	1.189	.0455	14	3/4	3/8
1	1 11/32	1.309	.0580	11	7/8	3/8
1 1/4	1 11/16	1.650	.0580	11	1	1/2
1 1/2	1 29/32	1.882	.0580	11	1	1/2
1 3/4	2 5/32	2.116	.0580	11	1 1/8	5/8
2	2 3/8	2.347	.0580	11	1 1/8	5/8
2 1/4	2 5/8	2.587	.0580	11	1 1/4	11/16
2 1/2	3	2.960	.0580	11	1 1/4	11/16
2 3/4	3 1/4	3.210	.0580	11	1 3/8	13/16
3	3 1/2	3.460	.0580	11	1 3/8	13/16
3 1/4	3 3/4	3.700	.0580	11	1 1/2	7/8
3 1/2	4	3.950	.0580	11	1 1/2	7/8
3 3/4	4 1/4	4.200	.0580	11	1 1/2	7/8
4	4 1/2	4.450	.0580	11	1 5/8	1
4 1/2	5	4.950	.0580	11	1 5/8	1
5	5 1/2	5.450	.0580	11	1 3/4	1 1/8
5 1/2	6	5.950	.0580	11	1 7/8	1 1/4
6	6 1/2	6.450	.0580	11	2	1 3/8
7	7 1/2	7.450	.0640	10	2 1/8	1 3/8
8	8 1/2	8.450	.0640	10	2 1/4	1 1/2
9	9 1/2	9.450	.0640	10	2 1/4	1 1/2
10	10 1/2	10.450	.0640	10	2 3/8	1 5/8
11	11 1/2	11.450	.0800	8	2 1/2	1 5/8
12	12 1/2	12.450	.0800	8	2 1/2	1 5/8
13	13 3/4	13.680	.0800	8	2 5/8	1 5/8
14	14 3/4	14.680	.0800	8	2 3/4	1 3/4
15	15 3/4	15.680	.0800	8	2 3/4	1 3/4
16	16 3/4	16.680	.0800	8	2 7/8	1 7/8
17	17 3/4	17.680	.0800	8	3	2
18	18 3/4	18.680	.0800	8	3	2

PIPE BENDS

MADE FROM

LAP WELDED PIPE

We have all the facilities for bending and finishing all sizes of pipe, and can furnish bends in Full Weight, Extra Strong or Double Extra Strong Wrought Pipe, equipped with screwed, shrunk, Cranelap or Cranweld Flanges in Standard, Extra Heavy or Hydraulic dimensions. These flanges can be made of Cast Iron, Ferrosteel, Malleable Iron, Cast Steel or Forged Steel, with one exception: Craneweld flanges can only be furnished in Forged Steel.

Where bends are used to take care of expansion and contraction movements, the flanges should be Extra Heavy Cast Steel or Forged Steel or Malleable Iron to provide sufficient strength for the strains.

The thickness of the wall of the pipe in a bend should be determined by the pressure under which the bend is to be operated and the diameter of the pipe. We will be pleased to give our recommendations for any particular service. The thicknesses given in the table below are the lightest we recommend and carry a sufficient safety factor, taking into consideration the scaling of pipe in the bending fire and thinning of wall due to stretching during the bending process.

THICKNESS OF PIPE FOR VARIOUS BENDS

UP TO 125 POUNDS WORKING PRESSURE

RADIUS	PIPE SIZE	PIPE
4 to 5 diameters	7 inches and smaller	Extra strong.
	8 inches and larger	½ inch thick.
Over 5 diameters	7 inches and smaller	Full weight.
	8 inches	28.55 pounds per foot.
	10 inches	40.48 pounds per foot.
	12 inches	49.56 pounds per foot.
	14 inches to 16 inches, inclusive	5/16 inch thick.
	18 inches to 22 inches, inclusive	3/8 inch thick.
	24 inches to 30 inches, inclusive	7/16 inch thick.

125 POUNDS TO 250 POUNDS WORKING PRESSURE

4 to 5 and 6 diameters	7 inches and smaller	Extra strong.
	8 inches and larger	½ inch thick.
Over 6 diameters	7 inches and smaller	Full weight.
	8 inches	28.55 pounds per foot.
	10 inches	40.48 pounds per foot.
	12 inches	49.56 pounds per foot.
	14 inches to 16 inches, inclusive	3/8 inch thick.
	18 inches to 22 inches, inclusive	7/16 inch thick.
	24 inches to 30 inches, inclusive	½ inch thick.

250 POUNDS TO 350 POUNDS WORKING PRESSURE

4 diameters and over	7 inches and smaller	Extra strong.
	8 inches and larger	½ inch thick.

(CONTINUED)

PIPE BENDS—CONTINUED

By use of special machinery for threading and flanging, we are enabled to turn out work that is absolutely correct. A Crane bend is exact to the number of degrees ordered, and the flanges are made on at 90 degrees to the axis of the pipe in the tanget, so that it is not necessary to force the bend into place and bolt it up in the line under an angular strain.

Every bend is carefully tested under hydraulic pressure before shipment. In the table of page 587 we give the shortest recommended radii and tangents for different sizes of full weight and extra strong pipe; but wherever possible, these radii should be increased to allowable limits, as a short radius bend is not as flexible as one built with a longer radius. In addition it is more difficult to avoid buckles where the pipe is bent to a short radius. Five to six diameters of the pipe make a safe radius.

On pages 589 and 590, we show designs of pipe bends in common use, but our facilities do not confine us to the bends shown. We can make special bends conforming to any shape or dimensions to which it is practicable to bend pipe.

On page 592, we show a table giving the approximate length of pipe in quarter bends. The limit of this table is a random 20 foot length of pipe; however, it is possible to procure some sizes in 40 foot lengths and bends may be designed to come within these limits. Two or more lengths of pipe may be welded together to form bends.

On page 591, we show a table giving the value of the various types of bends for taking care of expansion and contraction movements.

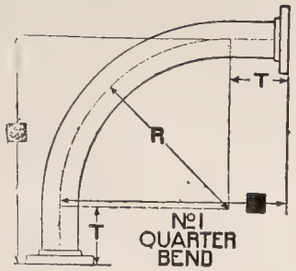
SPECIFICATIONS FOR BENDS

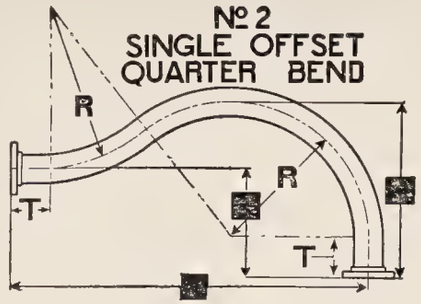
A request for an estimate, or an order for bends should be accompanied by a sketch or blue-print showing all the necessary dimensions. In addition we should be furnished with information relative to the thickness of pipe desired in the bend and the type of flanges to be furnished.

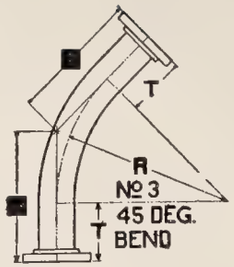
COMMERCIAL PIPE BENDS

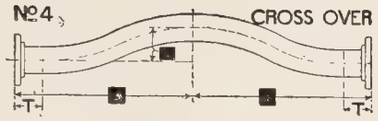
When Pipe Bends are wanted for rough work, either with or without flanges, and where it is not necessary to furnish them to exact angle and length, nor tested; we can supply such Bends at a much lower price than for Bends which require accurate and specific dimensions. Prices quoted on receipt of description and quantities wanted.

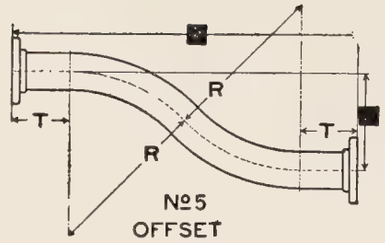
PIPE BENDS MADE FROM LAP WELDED STEEL PIPE







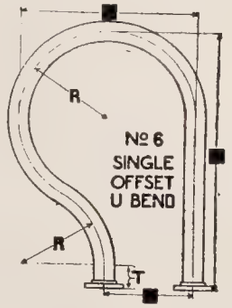


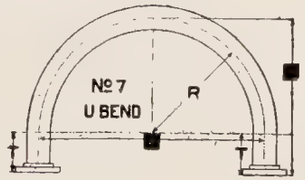


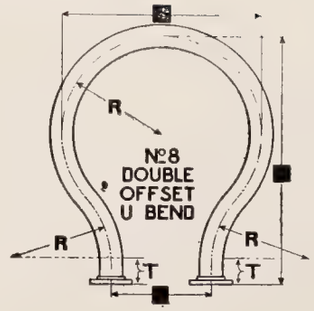
Size of Pipe.....Inches	2½	3	3½	4	4½	5	6	7	8	9	10	12	14	15	16	18	20	22	24
Size of Pipe.....Millimeters	64	76	90	100	113	125	150	175	200	225	250	300	350	375	400	450	500	550	600
R—Minimum Advisable Radius of Bends..Inches	12½	15	17½	20	22½	25	30	35	40	45	50	60	70	75	80	108	120	132	144
Shortest Radius to which Pipe can be bent — *Standard Pipe.....Inches	10	12	14	16	18	20	26	30	34	42	45	54	70	75	80	90	104	132	144
Shortest Radius to which Pipe can be bent — †Extra Strong Pipe.Inches	7	8	10	12	14	15	20	24	28	35	40	50	65	70	78	88	104	132	144
T—Minimum Length of Tangent or Straight Part of Bends — Screwed and Shrink.Inches	4	4	5	5	6	6	7	8	9	11	12	14	16	16	18	18	18	18	18
T—Minimum Length of Tangent or Straight Part of Bends — Craneweld.....Inches		5	5	5	5	5	6	6	6	6	7	7	7	7	8	8	8	9	9
T—Minimum Length of Tangent or Straight Part of Bends — Cranelap.....Inches		6	6	6	6	7	7	8	8	9	10	10	14	14	16	18	18	20	20

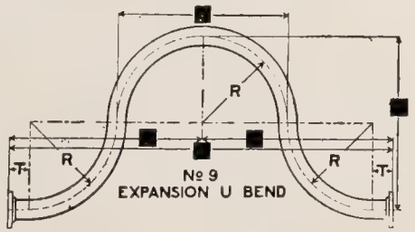
*For 14 inch O. D. Pipe and larger having 7/16 inch or lighter metal.
†For 14 inch O. D. Pipe and larger having ½ inch or heavier metal.
Full dimension sketch or blue print, should accompany all inquiries or orders for Bends.
Drawings submitted, should include dimensions R, T, and dimensions marked ■ where necessary, and any other variations from dimensions as given in the above table.

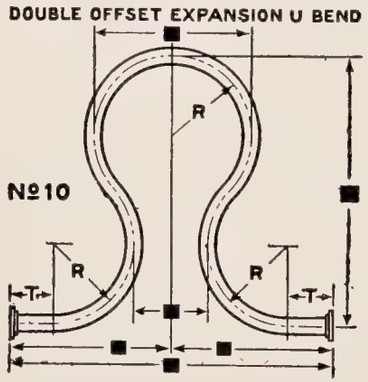
EXPANSION PIPE BENDS MADE FROM LAP WELDED STEEL PIPE

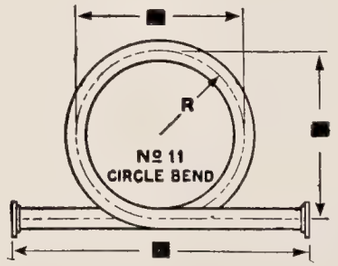












Size of Pipe	Inches	2½	3	3½	4	4½	5	6	7	8	9	10	12	14	15	16	18	20	22	24
Size of Pipe	Millimeters	64	76	90	100	113	125	150	175	200	225	250	300	350	375	400	450	500	550	600
R—Minimum Advisable Radius of Bends	Inches	12½	15	17½	20	22½	25	30	35	40	45	50	60	70	75	80	108	120	132	144
Shortest Radius to which Pipe can be bent	*Standard Pipe Inches	10	12	14	16	18	20	26	30	34	42	45	54	70	75	80	90	104	132	144
	†Extra Strong Pipe Inches	7	8	10	12	14	15	20	24	28	35	40	50	65	70	78	88	104	132	144
T—Minimum Length of Tangent or Straight Part of Bends	Screwed and Shrink Inches	4	4	5	5	6	6	7	8	9	11	12	14	16	16	18	18	18	18	18
	Craneweld Inches		5	5	5	5	5	6	6	6	6	7	7	7	7	8	8	8	9	9
	Cranelap Inches		6	6	6	6	7	7	8	8	9	10	10	14	14	16	18	18	20	20

*For 14 inch O. D. Pipe and larger having $\frac{7}{16}$ inch or lighter metal.

†For 14 inch O. D. Pipe and larger having ½ inch or heavier metal.

Full dimension sketch or blue print, should accompany all inquiries or orders for Bends.

Drawings submitted, should include dimensions R, T, and dimensions marked ■ where necessary, and any other variations from dimensions as given in the above table.

EXPANSION BENDS

TABLE GIVING EXPANSION CARED FOR

Because of many inquiries and the necessity of having reliable data on the expansion value of pipe bends, Crane Co. made exhaustive and extensive tests on the various types of bends in several sizes and weights of pipe. The following figures giving in inches the expansion cared for by quarter bends are based on the results of these tests and are recommended as allowing a good safety factor:

Size of Pipe Inches	Mean Radius of Bend Inches													
	Milli-meters	12	15	20	30	40	50	60	70	80	90	100	110	120
1	25	1/4	3/8	3/4	1 3/4	3 1/8								
2	50	1/8	3/4	1/2	1	1 3/4	2 3/4	3 7/8	5 3/8					
2 1/2	64		1/4	3/8	7/8	1 1/2	2 1/4	3 1/4	4 1/2	5 3/4				
3	76		1/8	3/8	5/8	1 1/8	1 7/8	2 5/8	3 5/8	4 3/4	6			
3 1/2	90			1/4	5/8	1	1 5/8	2 3/8	3 1/8	4 1/8	5 1/4			
4	100			1/4	1/2	1	1 1/2	2	2 7/8	3 3/4	4 3/4	5 3/4		
4 1/2	113				1/2	7/8	1 3/8	1 7/8	2 1/2	3 3/8	4 1/4	5 1/4		
5	125				3/8	3/4	1 1/8	1 5/8	2 1/4	3	3 3/4	4 5/8	5 5/8	
6	150				3/8	5/8	1	1 3/8	1 7/8	2 1/2	3 1/8	3 7/8	4 3/4	5 5/8
8	200					1/2	3/4	1	1 1/2	1 7/8	2 1/2	3	3 5/8	4 3/8
10	250						5/8	7/8	1 1/8	1 1/2	2	2 3/8	2 7/8	3 1/2
12	300							3/4	1	1 3/8	1 5/8	2	2 1/2	2 7/8
14	350								7/8	1 1/8	1 3/8	1 3/4	2 1/8	2 1/2
15	375									1	1 3/8	1 5/8	2	2 3/8
16	400									7/8	1 1/4	1 1/2	1 7/8	2 1/4
18	450												1 5/8	1 7/8
20	500													1 3/4

The above figures are for No. 1 Quarter Bends. See page 589.

For No. 7 "U" Bends, multiply expansion values by 2.

For No. 6 Single Offset Bends or No. 9 Expansion "U" Bends, multiply expansion values by 4.

For No. 10 Double Offset Bends or No. 11 Circle Bends, multiply expansion values by 5.

THE EXPANSION SHOWN IN THE ABOVE TABLE DOES NOT TAKE INTO CONSIDERATION SPRINGING THE BEND WHEN BOLTING INTO PLACE.

WHEN BENDS ARE SPRUNG, A DISTANCE EQUAL TO THE FIGURE GIVEN IN THE ABOVE TABLE, THEY WILL TAKE CARE OF TWICE THAT FIGURE.

APPROXIMATE LENGTH OF

PIPE IN QUARTER BENDS

EXCLUSIVE OF TANGENTS

Radius Inches	Length Inches	Radius Inches	Length Inches	Radius Inches	Length Inches	Radius Inches	Length Inches
4	6¼	42	66	80	125¾	118	185¼
5	7¾	43	67½	81	127¼	119	187
6	9½	44	69¼	82	128¾	120	188½
7	11	45	70¾	83	130½	121	190
8	12½	46	72¼	84	132	122	191½
9	14¼	47	73¾	85	133½	123	193¼
10	15¾	48	75½	86	135	124	194¾
11	17¼	49	77	87	136¾	125	196¼
12	18¾	50	78½	88	138¼	126	198
13	20½	51	80	89	139¾	127	199½
14	22	52	81¾	90	141¼	128	201
15	23½	53	83¼	91	143	129	202¾
16	25¼	54	84¾	92	144½	130	204¼
17	26¾	55	86½	93	146	131	205¾
18	28¼	56	87½	94	147¾	132	207¼
19	29¾	57	89½	95	149¼	133	209
20	31½	58	91	96	150¾	134	210½
21	33	59	92¾	97	152¼	135	212
22	34½	60	94¼	98	154	136	213¾
23	36¼	61	95¾	99	155½	137	215¼
24	37¾	62	97½	100	157	138	216¾
25	39¼	63	99	101	158¾	139	218¼
26	40¾	64	100½	102	160¼	140	220
27	42½	65	102	103	161¾	141	221½
28	44	66	103¾	104	163¼	142	223
29	45½	67	105¼	105	165	143	224¾
30	47¼	68	106¾	106	166½	144	226¼
31	48¾	69	108½	107	168	145	227¾
32	50¼	70	110	108	169¾	146	229¼
33	51¾	71	111½	109	171¼	147	231
34	53½	72	113	110	172¾	148	232½
35	55	73	114½	111	174¼	149	234
36	56½	74	116¼	112	176	150	235½
37	58¼	75	117¾	113	177½	151	237¼
38	59¾	76	119½	114	179	152	238¾
39	61¼	77	121	115	180¾	153	240¼
40	62¾	78	122½	116	182¼	154	242
41	64½	79	124	117	183¾	155	243½

EXPANSION OF STEAM PIPES

The linear expansion and contraction of pipe, due to differences of temperature of the fluid carried and the surrounding air, must be cared for by suitable expansion joints or bends.

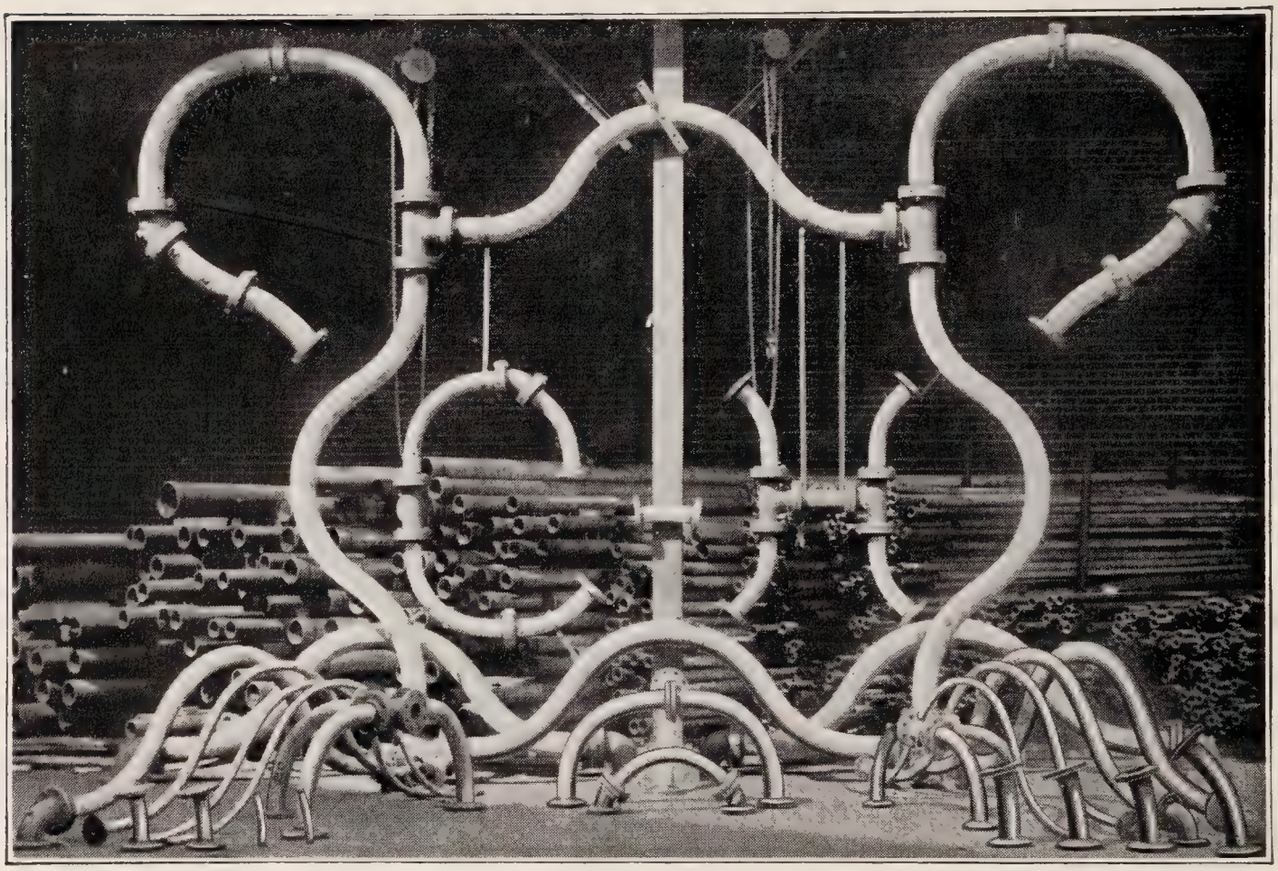
In order to determine the amount of expansion or contraction in a pipe line, we give below a table showing the increase in length of a pipe 100 feet long at various temperatures.

The expansion for any length of pipe may be found by taking the difference in increased length at the minimum and maximum temperatures, dividing by 100 and multiplying by the length of the line under consideration.

EXPANSION OF PIPE

INCREASE IN LENGTH—INCHES PER 100 FEET

Temperature, Degrees F.	Steel	Wrought Iron	Cast Iron	Brass and Copper
0	0	0	0	0
20	.15	.15	.10	.25
40	.30	.30	.25	.45
60	.45	.45	.40	.65
80	.60	.60	.55	.90
100	.75	.80	.70	1.15
120	.90	.95	.85	1.40
140	1.10	1.15	1.00	1.65
160	1.25	1.35	1.15	1.90
180	1.45	1.50	1.30	2.15
200	1.60	1.65	1.50	2.40
220	1.80	1.85	1.65	2.65
240	2.00	2.05	1.80	2.90
260	2.15	2.20	1.95	3.15
280	2.35	2.40	2.15	3.45
300	2.50	2.60	2.35	3.75
320	2.70	2.80	2.50	4.05
340	2.90	3.05	2.70	4.35
360	3.05	3.25	2.90	4.65
380	3.25	3.45	3.10	4.95
400	3.45	3.65	3.30	5.25
420	3.70	3.90	3.50	5.60
440	3.95	4.20	3.75	5.95
460	4.20	4.45	4.00	6.30
480	4.45	4.70	4.25	6.65
500	4.70	4.90	4.45	7.05
520	4.95	5.15	4.70	7.45
540	5.20	5.40	4.95	7.85
560	5.45	5.70	5.20	8.25
580	5.70	6.00	5.45	8.65
600	6.00	6.25	5.70	9.05
620	6.30	6.55	5.95	9.50
640	6.55	6.85	6.25	9.95
660	6.90	7.20	6.55	10.40
680	7.20	7.50	6.85	10.95
700	7.50	7.85	7.15	11.40
720	7.80	8.20	7.45	11.90
740	8.20	8.55	7.80	12.40
760	8.55	8.90	8.15	12.95
780	8.95	9.30	8.50	13.50
800	9.30	9.75	8.90	14.10



PIPE BENDS IN ANY SIZE OR SHAPE

Pipe bends in all sizes and practical shapes are supplied by Crane Co. They can be provided in either full weight, extra strong or double extra strong wrought pipe fitted with screwed, shrunk, Cranelap or Craneweld flanges of cast-iron, ferrosteel, malleable iron, cast-steel or forged steel. Crane pipe bends are produced in a plant which is fully equipped for bending pipe to any shape, true to specified dimensions. Each unit is tested under hydraulic pressure before shipment.

ESTIMATES FURNISHED ON RECEIPT OF SPECIFICATIONS

(1914 BRASS STANDARD)

TEMPLATES FOR DRILLING

BRASS FLANGED VALVES AND FITTINGS

"HEAVY" FOR PRESSURES UP TO 150 POUNDS

Size Inches	Size Millimeters	Diameter of Flange Inches	Thickness of Flange Inches	Bolt Circle Inches	Number of Bolts	Size of Bolts Inches	Length of Bolts Inches
1/4 and 3/8	6 and 10	2 1/2	9/32	1 11/16	4	3/8	1
1/2	13	3	5/16	2 1/8	4	3/8	1 1/4
3/4	19	3 1/2	11/32	2 1/2	4	3/8	1 1/4
1	25	4	3/8	3	4	7/16	1 1/4
1 1/4	32	4 1/2	13/32	3 3/8	4	7/16	1 1/2
1 1/2	38	5	7/16	3 7/8	4	1/2	1 1/2
2	50	6	1/2	4 3/4	4	5/8	1 3/4
2 1/2	64	7	9/16	5 1/2	4	5/8	2
3	76	7 1/2	5/8	6	4	5/8	2
3 1/2	90	8 1/2	11/16	7	8	5/8	2 1/4
4	100	9	11/16	7 1/2	8	5/8	2 1/4
4 1/2	113	9 1/4	23/32	7 3/4	8	3/4	2 1/2
5	125	10	3/4	8 1/2	8	3/4	2 1/2
6	150	11	13/16	9 1/2	8	3/4	2 3/4
7	175	12 1/2	7/8	10 3/4	8	3/4	2 3/4
8	200	13 1/2	15/16	11 3/4	8	3/4	3
9	225	15	15/16	13 1/4	12	3/4	3
10	250	16	1	14 1/4	12	7/8	3 1/4
12	300	19	1 1/16	17	12	7/8	3 1/4

"EXTRA HEAVY" FOR PRESSURES UP TO 250 POUNDS

Size Inches	Size Millimeters	Diameter of Flange Inches	Thickness of Flange Inches	Bolt Circle Inches	Number of Bolts	Size of Bolts Inches	Length of Bolts Inches
1/4 and 3/8	6 and 10	3	3/8	2	4	7/16	1 1/4
1/2	13	3 1/2	13/32	2 3/8	4	7/16	1 1/2
3/4	19	4	7/16	2 7/8	4	1/2	1 1/2
1	25	4 1/2	1/2	3 1/4	4	1/2	1 3/4
1 1/4	32	5	17/32	3 3/4	4	1/2	1 3/4
1 1/2	38	6	9/16	4 1/2	4	5/8	2
2	50	6 1/2	5/8	5	4	5/8	2
2 1/2	64	7 1/2	11/16	5 7/8	4	3/4	2 1/4
3	76	8 1/4	3/4	6 5/8	8	3/4	2 1/2
3 1/2	90	9	13/16	7 1/4	8	3/4	2 3/4
4	100	10	7/8	7 7/8	8	3/4	2 3/4
4 1/2	113	10 1/2	7/8	8 1/2	8	3/4	2 3/4
5	125	11	15/16	9 1/4	8	3/4	3
6	150	12 1/2	1	10 5/8	12	3/4	3
7	175	14	1 1/16	11 7/8	12	7/8	3 1/4
8	200	15	1 1/8	13	12	7/8	3 1/2
9	225	16 1/4	1 1/8	14	12	1	3 1/2
10	250	17 1/2	1 3/16	15 1/4	16	1	3 3/4
12	300	20 1/2	1 1/4	17 3/4	16	1 1/8	4

Bolt Holes drilled 1/16 inch larger than bolt diameter, 2 inch size and smaller and 1/8 inch larger for 2 1/2 inch size and larger. "Heavy" and "Extra Heavy" flanges have smooth faces scored. Full Faced Gaskets should be used. When brass flanged material is to be bolted to Extra Heavy iron flanges, valves or fittings, the iron material should be ordered with plain faces. Diameters given are finished dimensions.

TEMPLATES FOR DRILLING

STANDARD AND LOW PRESSURE FLANGED VALVES AND FITTINGS

AMERICAN STANDARD

EFFECTIVE JANUARY 1, 1914

Size Inches	Size Millimeters	Diameter of Flanges Inches	Thickness of Flanges Inches	Bolt Circle Inches	Number of Bolts Inches	Size of Bolts Inches	Length of Bolts Inches	Length of Studs with 2 Nuts Inches
1	25	4	7/16	3	4	7/16	1 1/2	
1 1/4	32	4 1/2	1/2	3 3/8	4	7/16	1 1/2	
1 1/2	38	5	9/16	3 7/8	4	1/2	1 3/4	
2	50	6	5/8	4 3/4	4	5/8	2	
2 1/2	64	7	11/16	5 1/2	4	5/8	2 1/4	
3	76.	7 1/2	3/4	6	4	5/8	2 1/4	
3 1/2	90	8 1/2	13/16	7	4	5/8	2 1/2	
4	100	9	15/16	7 1/2	8	5/8	2 3/4	
4 1/2	113	9 1/4	15/16	7 3/4	8	3/4	2 3/4	
5	125	10	15/16	8 1/2	8	3/4	2 3/4	
6	150	11	1	9 1/2	8	3/4	3	
7	175	12 1/2	1 1/16	10 3/4	8	3/4	3	
8	200	13 1/2	1 1/8	11 3/4	8	3/4	3 1/4	
9	225	15	1 1/8	13 1/4	12	3/4	3 1/4	
10	250	16	1 3/16	14 1/4	12	7/8	3 1/2	
12	300	19	1 1/4	17	12	7/8	3 1/2	
14	350	21	1 3/8	18 3/4	12	1	4	
15	375	22 1/4	1 3/8	20	16	1	4	
16	400	23 1/2	1 7/16	21 1/4	16	1	4	
18	450	25	1 9/16	22 3/4	16	1 1/8	4 1/2	
20	500	27 1/2	1 11/16	25	20	1 1/8	4 3/4	
22	550	29 1/2	1 13/16	27 1/4	20	1 1/4	5	
24	600	32	1 7/8	29 1/2	20	1 1/4	5 1/4	
26	650	34 1/4	2	31 3/4	24	1 1/4	5 1/2	
28	700	36 1/2	2 1/16	34	28	1 1/4	5 1/2	
30	750	38 3/4	2 1/8	36	28	1 3/8	5 3/4	
32	800	41 3/4	2 1/4	38 1/2	28	1 1/2	6 1/4	
34	850	43 3/4	2 5/16	40 1/2	32	1 1/2	6 1/2	
36	900	46	2 3/8	42 3/4	32	1 1/2	6 1/2	
38	950	48 3/4	2 3/8	45 1/4	32	1 5/8	6 3/4	9
40	1000	50 3/4	2 1/2	47 1/4	36	1 5/8	7	9

These Drilling Templates are in multiples of four, so that fittings may be made to face in any quarter and bolt holes straddle the center line.

Bolt holes are drilled 1/8 inch larger than nominal diameter of bolts.

Bolt holes are spot faced only when so ordered except Cast Steel which are always furnished spot faced.

Templates for drilling BRASS flanges, see page 595.

TEMPLATES FOR DRILLING

STANDARD AND LOW PRESSURE FLANGED VALVES AND FITTINGS

AMERICAN STANDARD

EFFECTIVE JANUARY 1, 1914
CONTINUED

Size Inches	Size Millimeters	Diameter of Flanges Inches	Thickness of Flanges Inches	Bolt Circle Inches	Number of Bolts Inches	Size of Bolts Inches	Length of Bolts Inches	Length of Studs with 2 Nuts Inches
42	1050	53	2 5/8	49 1/2	36	1 5/8	7 1/4	9 1/2
44	1100	55 1/4	2 5/8	51 3/4	40	1 5/8	7 1/4	9 1/2
46	1150	57 1/4	1 11/16	53 3/4	40	1 5/8	7 1/2	9 1/2
48	1200	59 1/2	2 3/4	56	44	1 5/8	7 1/2	9 1/2
50	1250	61 3/4	2 3/4	58 1/4	44	1 3/4	7 3/4	10
52	1300	64	2 7/8	60 1/2	44	1 3/4	8	10 1/2
54	1350	66 1/4	3	62 3/4	44	1 3/4	8 1/4	10 1/2
56	1400	68 3/4	3	65	48	1 3/4	8 1/4	10 1/2
58	1450	71	3 1/8	67 1/4	48	1 3/4	8 1/2	11
60	1500	73	3 1/8	69 1/4	52	1 3/4	8 1/2	11
62	1550	75 3/4	3 1/4	71 3/4	52	1 7/8	9	11 1/2
64	1600	78	3 1/4	74	52	1 7/8	9	11 1/2
66	1650	80	3 3/8	76	52	1 7/8	9 1/4	11 1/2
68	1700	82 1/4	3 3/8	78 1/4	56	1 7/8	9 1/4	11 1/2
70	1750	84 1/2	3 1/2	80 1/2	56	1 7/8	9 1/2	12
72	1800	86 1/2	3 1/2	82 1/2	60	1 7/8	9 1/2	12
74	1850	88 1/2	3 5/8	84 1/2	60	1 7/8	9 3/4	12
76	1900	90 3/4	3 5/8	86 1/2	60	1 7/8	9 3/4	12
78	1950	93	3 3/4	88 3/4	60	2	10	12 1/2
80	2000	95 1/4	3 3/4	91	60	2	10	12 1/2
82	2050	97 1/2	3 7/8	93 1/4	60	2	10 1/2	13
84	2100	99 3/4	3 7/8	95 1/2	64	2	10 1/2	13
86	2150	102	4	97 3/4	64	2	10 1/2	13
88	2200	104 1/4	4	100	68	2	10 1/2	13
90	2250	106 1/2	4 1/8	102 1/4	68	2 1/8	11	14
92	2300	108 3/4	4 1/8	104 1/2	68	2 1/8	11	14
94	2350	111	4 1/4	106 1/4	68	2 1/8	11 1/4	14
96	2400	113 1/4	4 1/4	108 1/2	68	2 1/4	11 1/2	14 1/2
98	2450	115 1/2	4 3/8	110 3/4	68	2 1/4	11 1/2	14 1/2
100	2500	117 3/4	4 3/8	113	68	2 1/4	11 1/2	14 1/2

These Drilling Templates are in multiples of four, so that fittings may be made to face in any quarter and bolt holes straddle the center line.

Bolt holes are drilled 1/8 inch larger than nominal diameter of bolts.

Bolt holes are spot faced only when so ordered except Cast Steel which are always furnished spot faced.

Templates for drilling BRASS flanges, see page 595.

AMERICAN STANDARD

TEMPLATES FOR DRILLING

EXTRA HEAVY AND MEDIUM FLANGED VALVES AND EXTRA HEAVY FLANGED FITTINGS

EFFECTIVE JANUARY 1, 1914

Size Inches	Size Millimeters	Diameter of Flanges Inches	Thickness of Flanges Inches	Bolt Circle Inches	Number of Bolts	Size of Bolts Inches	Length of Bolts Inches	Length of Studs with 2 Nuts Inches
1	25	4½	11/16	3¼	4	½	2	
1¼	32	5	¾	3¾	4	½	2¼	
1½	38	6	13/16	4½	4	⅝	2½	
2	50	6½	⅞	5	4	⅝	2½	
2½	64	7½	1	5⅞	4	¾	3	
3	76	8¼	1⅛	6⅝	8	¾	3¼	
3½	90	9	13/16	7¼	8	¾	3¼	
4	100	10	1¼	7⅞	8	¾	3½	
4½	113	10½	15/16	8½	8	¾	3½	
5	125	11	1⅜	9¼	8	¾	3¾	
6	150	12½	17/16	10⅝	12	¾	3¾	
7	175	14	1½	11⅞	12	⅞	4	
8	200	15	1⅝	13	12	⅞	4¼	
9	225	16¼	1¾	14	12	1	4¾	
10	250	17½	1⅞	15¼	16	1	5	
12	300	20½	2	17¾	16	1⅛	5¼	
14	350	23	2⅛	20¼	20	1⅛	5½	
15	375	24½	23/16	21½	20	1¼	5¾	
16	400	25½	2¼	22½	20	1¼	6	
18	450	28	2⅜	24¾	24	1¼	6¼	
20	500	30½	2½	27	24	1⅜	6½	
22	550	33	2⅝	29¼	24	1½	7	
24	600	36	2¾	32	24	1⅝	7½	9½
26	650	38¼	213/16	34½	28	1⅝	7¾	10
28	700	40¾	215/16	37	28	1⅝	8	10
30	750	43	3	39¼	28	1¾	8¼	10½
32	800	45¼	3⅛	41½	28	1⅞	8½	11
34	850	47½	3¼	43½	28	1⅞	9	11½
36	900	50	3⅜	46	32	1⅞	9¼	11½
38	950	52¼	37/16	48	32	1⅞	9¼	11½
40	1000	54½	39/16	50¼	36	1⅞	9½	12
42	1050	57	311/16	52¾	36	1⅞	9¾	12
44	1100	59¼	3¾	55	36	2	10	12½
46	1150	61½	3⅞	57¼	40	2	10¼	13
48	1200	65	4	60¾	40	2	10½	13

These Drilling Templates are in multiples of four, so that fittings may be made to face in any quarter, and bolt holes straddle the center line.

Bolt holes are drilled ⅛-inch larger than nominal diameter of bolts.

For Flanges with Male and Female or Tongue and Groove Faces add ¼-inch to the bolt length given in table above.

For Cranelap Joints for each flange add the thickness of the pipe to the bolt length given in table above.

Templates for drilling BRASS Flanges, see page 595.

Bolt holes are spot faced only when so ordered, except Cast Steel which are always furnished spot faced.

IMPORTANT NOTICE

CHANGES IN DIMENSIONS AND DRILLING TEMPLATES OF HYDRAULIC FERROSTEEL MATERIAL

800-POUND VALVES AND FITTINGS

JULY, 1923

For some years we have shown in our catalogues an 800-pound line of Extra Heavy Hydraulic Ferrosteel Gate Valves, Swing Check Valves and Flanged Fittings, which has had flange dimensions and a drilling template known as the "Crane Hydraulic Standard." This drilling template is given in our No. 50 catalogue, page 653, and is the same as that published by Crane Co. since about 1898.

In 1918, the American Society of Mechanical Engineers approved Standards for 800, 1200 and 3000-pound Hydraulic Working Pressures. The 800-pound American Hydraulic Standard (as it is now designated) for Ferrosteel Flanges and Flanged Fittings differs in many respects from the old "Crane Hydraulic Standard." The 800-pound Hydraulic Ferrosteel material shown in the No. 51 catalogue replaces the "Extra Heavy Hydraulic Ferrosteel" material shown in our No. 50 catalogue and is made to the 800-pound American Hydraulic Standard, except in a few instances where dimensional changes have been made through standardization work now in progress. For convenience, the Standard now used by Crane Co. may be referred to as the 800-pound American Hydraulic Standard (Revised).

The following table gives comparisons of the three drilling templates. It will be noted that this table indicates where the 800-pound American Hydraulic Standard (Revised) differs from both the old "Crane Hydraulic Standard" and the 800-pound American Hydraulic Standard of 1918, for example.

Flange Diameters of the Revised 800-pound American Hydraulic Standard are the same as the 800-pound American Hydraulic Standard except on the 2-inch size (reduced from 7 inches to 6¾ inches). The Revised Standard differs from the "Crane Hydraulic Standard" on all sizes except the 9-inch.

Flange Thicknesses of the Revised 800-pound American Hydraulic Standard are the same as the 800-pound American Hydraulic Standard on all sizes. The Revised Standard differs from the "Crane Hydraulic Standard" on all sizes except the 2, 2½ and 3-inch.

Diameters of Bolt Circles of the Revised 800-pound American Hydraulic Standard are the same as the 800-pound American Hydraulic Standard on all sizes. The Revised Standard differs from the "Crane Hydraulic Standard" on all sizes except the 9-inch.

Size and Number of Bolts of the Revised 800-pound American Hydraulic Standard are the same as the 800-pound American Hydraulic Standard except on the 2-inch size (changed from 4—¾-inch bolts to 8—⅝-inch bolts). The Revised Standard differs from the "Crane Hydraulic Standard" on the 2-inch size and on sizes 4-inch to 12-inch, inclusive.

Diameters of Male Face, etc., of the Revised 800-pound American Hydraulic Standard are the same as the 800-pound American Hydraulic Standard on sizes ½-inch to 3½-inch, inclusive, and 8-inch to 10-inch, inclusive; and differs from the "Crane Hydraulic Standard" on the 1½, 4, 4½, 5, 6, 7 and 12-inch sizes.

Height of Male Face, etc., is ¼-inch, which is the same as the 800-pound American Hydraulic Standard. The "Crane Hydraulic Standard" gives $\frac{3}{16}$-inch male face on sizes 6-inch and smaller and ¼-inch on the larger sizes.

FITTINGS AND VALVES

The center to face and face to face dimensions of flanged fittings are the same as the 800-pound American Hydraulic Standard, except that taper reducers (which were made to the same face to face dimensions as tees and crosses in the 800-pound American Hydraulic Standard) have been reduced in the face to face dimension, see our No. 51 catalogue. The "Crane Hydraulic Standard" fittings as formerly listed are entirely different, from present dimensions.

For valves, the comparison of end flanges is given in the table on the following page. All other dimensions of Screwed and Flanged Gate and Check Valves remain the same as the dimensions published in the No. 50 catalogue for "Extra Heavy Hydraulic Ferrosteel" valves, and as shown in our No. 51 catalogue.

COMPARISON OF 800-POUND HYDRAULIC DRILLING TEMPLATES

	800-pound American Hydraulic Standard (Revised Dec., 1922) — Ratings and dimensions used by Crane Co. Ferrosteel 800-pound Hydraulic Service Cast Steel 1000-pound Hydraulic Service 500-pound Superheated Steam Service. Note.—This Template has become known to some extent as the 400-pound Steam Standard. See Page 599 No. 51 Catalogue				800-pound American Hydraulic Standard (A. S. M. E. Bulletin No. 1654) 1918 — Ratings Recommended (A. S. M. E.) Semi Steel 800-pound Hydraulic Service Cast Steel 800-pound Hydraulic Service 400-pound Superheated Steam Service				Crane Hydraulic Standard — Ratings—Ferrosteel Previous to 1908 800-pound Hydraulic Service Since 1908 1½ to 2½-in. 1200-pound Hydraulic Service 3 to 4-in. 1000-pound Hydraulic Service 4½ to 12-in. 800-pound Hydraulic Service. Sizes 1½ to 12-in. published in No. 50 Catalogue, Page 653. Sizes not published have been used on special material. Note.—Sizes ¾ to 12-in. known as Western Hydraulic Standard.			
Size	Flange Diam.	Bolt Circle	Bolts	Diam. Male	Flange Diam.	Bolt Circle	Bolts	Diam. Male	Flange Diam.	Bolt Circle	Bolts	Diam. Male
½	3½	2⅜	4– 7/16	1⅜	x	x	x	x	4½	3¼	x	1½
¾	4	2⅞	4– ½	1 11/16	x	x	x	x	5	3¾	4– 7/16	2
1	4½	3¼	4– ½	2	x	x	x	x	5½	4¼	x	2 5/16
1¼	5	3¾	4– ½	2½	x	x	x	2¼	6½	5	4– ⅝	2¾
1½	6	4½	4– ⅝	2⅞	x	x	x	x	6½	5	x	3⅛
2	6¾	5¼	8– ⅝	3⅝	7	x	4–¾	x	7½	5¾	4– ¾	x
2½	7½	5⅞	8– ¾	4⅛	x	x	x	x	8¾	6½	x	x
3	8½	6½	8– ¾	5	x	x	x	x	10	8	x	x
3½	9½	7½	8– ⅞	5½	x	x	x	x	10¾	8½	x	x
4	10¾	8½	8– ⅞	6 3/16	x	x	x	6	11½	9⅜	8–1	6
4½	11½	9¼	8– ⅞	6¾	x	x	x	6½	12½	10	12–1	6½
5	13	10½	8–1	7 5/16	x	x	x	7¼	13½	11	12–1	7¼
6	14	11½	12–1	8½	x	x	x	8⅜	15	12½	12–1⅛	8⅜
7	15	12½	12–1	9⅝	x	x	x	9⅜	16	13⅜	16–1⅛	9⅜
8	16½	13¾	12–1⅛	10⅝	x	x	x	x	17	14⅛	16–1¼	x
9	18½	15½	16–1⅛	11⅝	x	x	x	x	x	x	16–1¼	x
10	20	17	16–1¼	12¾	x	x	x	x	21	17¾	20–1¼	x
12	22	19¼	20–1¼	15	x	x	x	15¼	23½	20⅜	20–1⅜	15¼
14 O.D.	23¾	20¾	20–1⅜	16¼					26½	23	24–1⅜	16½
15 O.D.	25½	22¼	20–1⅜	17¼					28	24½	24–1½	17½
16 O.D.	27	23¾	20–1½	18½					27½	26	24–1½	x
17 O.D.	28	24¾	20–1½	19¾								
18 O.D.	29	25¾	20–1½	21					32¼	28¾	28–1½	x
20 O.D.	31½	28¼	24–1½	23					36	31¾	28–1⅝	x
22 O.D.	34	30½	24–1⅝	25¼								
24 O.D.	36¾	33	24–1¾	27¼								

x—Indicates dimensions same as 800-pound American Hydraulic Standard (Revised Dec., 1922).

DRILLING TEMPLATES

800 POUND

AMERICAN HYDRAULIC STANDARD

FLANGED VALVES

FLANGES AND FLANGED FITTINGS

FERROSTEEL

Size Inches	Size Millimeters	Diameter of Flange	Thickness of Flange	Bolt Circle	Number Bolts	Size of Bolts	Length of Bolts	⊕ Diameter Raised or Male Face
1/2	13	3 1/2	9/16	2 3/8	4	7/16	2 1/4	1 3/8
3/4	19	4	5/8	2 7/8	4	1/2	2 1/2	1 11/16
1	25	4 1/2	11/16	3 1/4	4	1/2	2 1/2	2
1 1/4	32	5	3/4	3 3/4	4	1/2	2 3/4	2 1/4
1 1/2	38	6	13/16	4 1/2	4	5/8	3	2 7/8
2	50	6 3/4	1 1/4	5 1/4	8	5/8	4	3 5/8
2 1/2	64	7 1/2	1 3/8	5 7/8	8	3/4	4 1/4	4 1/8
3	76	8 1/2	1 1/2	6 1/2	8	3/4	4 1/2	5
3 1/2	90	9 1/2	1 5/8	7 1/2	8	7/8	4 3/4	5 1/2
4	100	10 3/4	1 7/8	8 1/2	8	7/8	5 1/4	6 3/16
4 1/2	113	11 1/2	2	9 1/4	8	7/8	5 1/2	6 3/4
5	125	13	2 1/8	10 1/2	8	1	6	7 5/16
6	150	14	2 1/4	11 1/2	12	1	6 1/4	8 1/2
7	175	15	2 3/8	12 1/2	12	1	6 1/2	9 5/8
8	200	16 1/2	2 1/2	13 3/4	12	1 1/8	7	10 5/8
9	225	18 1/2	2 3/4	15 1/2	16	1 1/8	7 1/2	11 5/8
10	250	20	2 7/8	17	16	1 1/4	7 3/4	12 3/4
12	300	22	3	19 1/4	20	1 1/4	8	15

These Drilling Templates are in multiples of four, so that fitting may be made to face in any quarter, and bolt holes straddle the center line.

Bolt Holes are drilled 1/8-inch larger than nominal diameter of bolts.

For Cranelap Joints for each flange add 1/4-inch to the bolt length given in the above table.

Square head bolts with Hexagonal Nuts are recommended.

Hexagonal Nuts on sizes 8-inch and smaller can be conveniently pulled up with Open End Wrenches with minimum design heads.

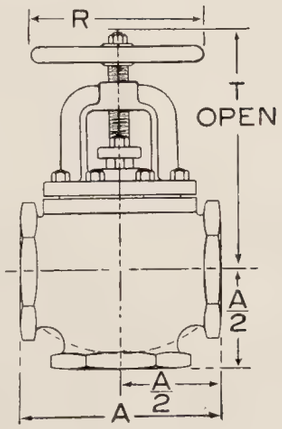
Hexagonal Nuts on sizes 9-inch and larger can be conveniently pulled up with Box Wrenches.

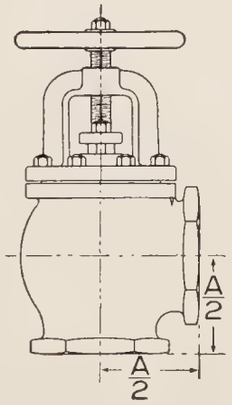
⊕Height of raised or male face is 1/4-inch.

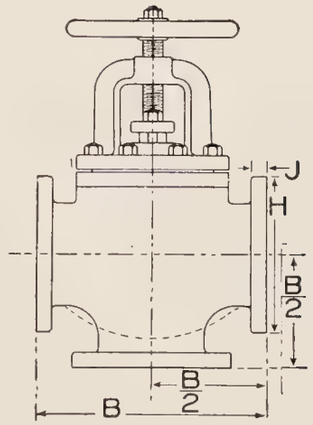
STANDARD GLOBE, ANGLE AND CROSS VALVES

GENERAL DIMENSIONS

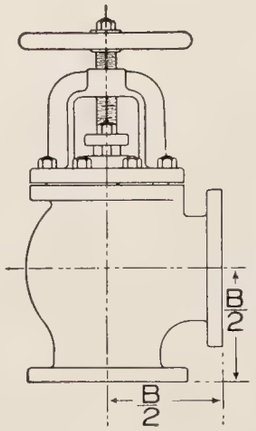
IRON BODY

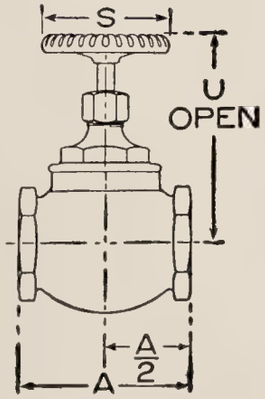


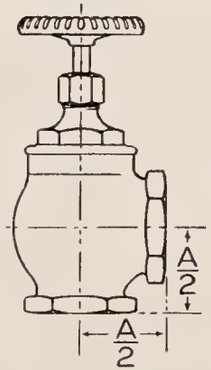


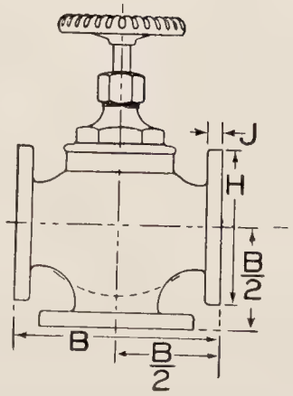


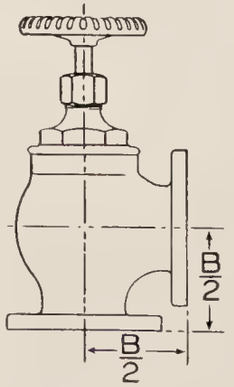
BRASS TRIMMINGS











FOR DIMENSION TABLE, SEE OPPOSITE PAGE

STANDARD GLOBE, ANGLE AND CROSS VALVES

GENERAL DIMENSIONS

IRON BODY **BRASS TRIMMINGS**

CATALOGUE Nos. 350, 351, 352, 353, 354, 355, 356, 357, 362, 363, 364, 365

Size	Inches	2	2½	3	3½	4	4½	5	6	7	8	10	12	14	15	16
Size	Millimeters	50	64	76	90	100	113	125	150	175	200	250	300	350	375	400
End to End, Screwed	Inches	6½	7	8	9	10	10½	11¼	13	14½	16	18¾	21¼			
Center to End, Screwed	Inches	3¼	3½	4	4½	5	5¼	5⅝	6½	7¼	8	9⅜	10⅝			
Face to Face, Flanged	Inches	8	8½	9½	10½	11½	12	13	14	16	17	20	24	28	30	32
Center to Face, Flanged	Inches	4	4¼	4¾	5¼	5¾	6	6½	7	8	8½	10	12	14	15	16
Diameter of Flanges	Inches	6	7	7½	8½	9	9¼	10	11	12½	13½	16	19	21	22¼	23½
Thickness of Flanges	Inches	⅝	11/16	¾	13/16	15/16	15/16	15/16	1	1 1/16	1 1/8	1 3/16	1¼	1⅜	1⅜	1 7/16
Diameter of Wheel, Yoke Valve	Inches	6½	6½	7½	7½	9	9	10	12	14	16	18	20	24	24	27
Diameter of Wheel, Brass Mounted Valve	Inches	4 1/16	5⅜	6												
Center to Top of Stem, Open, Yoke Valve	Inches	11⅛	11¾	13⅛	13⅞	15⅜	15½	17¼	19	21¼	23¾	27¾	31½	35½	39	39
Center to Top of Stem, Open, Brass Mounted Valve	Inches	7½	8¾	9¾												

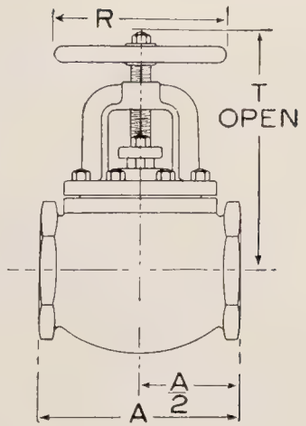
The heights from center of Valve to top of Stem in the above table are approximate only, but are accurate enough for figuring head room. They should not, however, be used to figure extended stems.

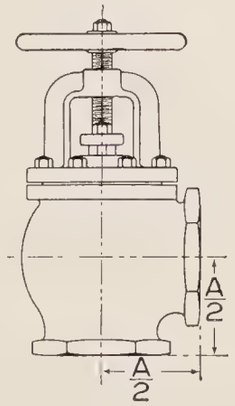
FOR DRILLING TEMPLATES, SEE PAGE 596

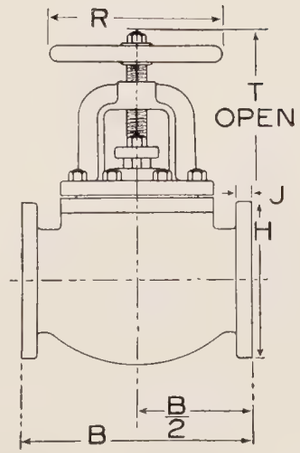
STANDARD GLOBE AND ANGLE VALVES

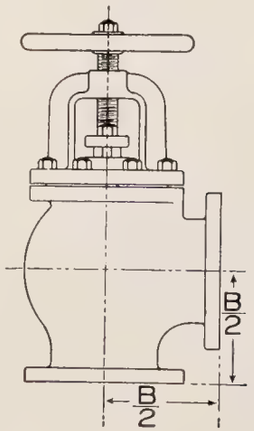
IRON BODY | CRANE RENEWABLE DISC | BRASS TRIMMINGS

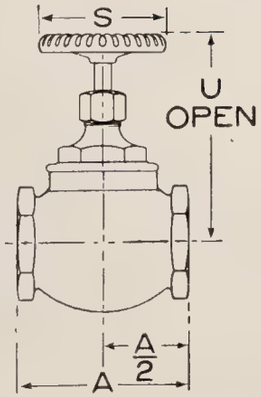
GENERAL DIMENSIONS

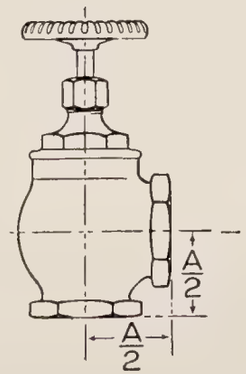


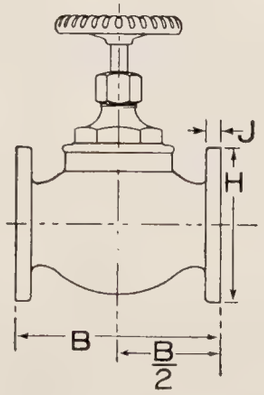


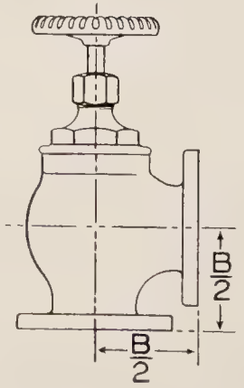












FOR DIMENSION TABLE, SEE FOLLOWING PAGE

STANDARD GLOBE AND ANGLE VALVES

CRANE RENEWABLE DISC

GENERAL DIMENSIONS

IRON BODY — **INCHES** — **BRASS TRIMMINGS**

CATALOGUE Nos. 358, 359, 360, 361

Size	Inches	2	2½	3	3½	4	4½	5	6	7	8	10	12
A—End to End, Screwed	Inches	6½	8	8¼	9½	10½	11¼	12¼	14	17			
$\frac{A}{2}$—Center to End, Screwed	Inches	3¼	4	4⅛	4¾	5¼	5⅝	6⅛	7	8½			
B—Face to Face, Flanged	Inches		9½	10	11	12	13	14	16	18	19½	24¼	27½
$\frac{B}{2}$—Center to Face, Flanged	Inches		4¾	5	5½	6	6½	7	8	9	9¾	12¼	13¾
H—Diameter of Flanges	Inches		7	7½	8½	9	9¼	10	11	12½	13½	16	19
J—Thickness of Flanges	Inches		11/16	¾	13/16	15/16	15/16	15/16	1	1 1/16	1⅛	1 3/16	1¼
R—Diameter of Wheel, Yoke Valve	Inches		6½	7½	7½	9	9	10	12	14	16	18	20
S—Diameter of Wheel, Brass Mounted Valve	Inches	4¾	5⅜	6									
T—Center to Top of Stem, Open, Yoke Valve	Inches		11	12¾	13⅜	15⅜	16	17⅝	19½	22	24¾	29	34
U—Center to Top of Stem, Open, Brass Mounted Valve	Inches	9	10	11⅝									

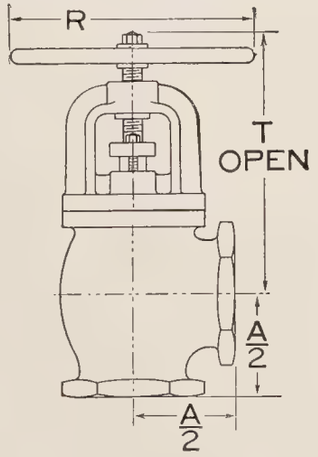
The heights from center of Valve to top of Stem in the above table are approximate only, but are accurate enough for figuring head room. They should not, however, be used for figuring extended stems.

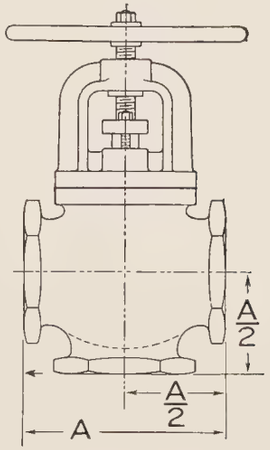
FOR DRILLING TEMPLATES, SEE PAGE 596

MEDIUM GLOBE, ANGLE AND CROSS VALVES

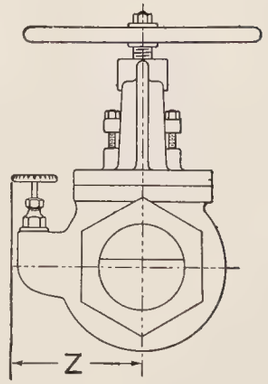
GENERAL DIMENSIONS

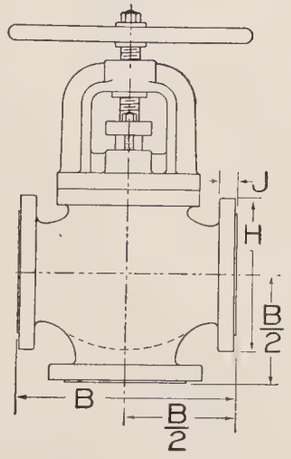
FERROSTEEL BODY

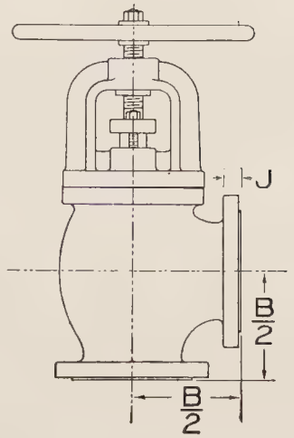


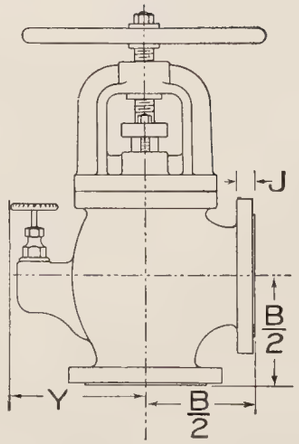


BRASS TRIMMINGS









FOR DIMENSION TABLE, SEE FOLLOWING PAGE

MEDIUM GLOBE, ANGLE AND CROSS VALVES

GENERAL DIMENSIONS

CATALOGUE Nos. 340, 341, 341 BP, 342, 343, 343 BP, 344, 345, 345 BP

Size	Inches	2	2½	3	3½	4	4½	5	6	7	8	10	12
Size	Millimeters	50	64	76	90	100	113	125	150	175	200	250	300
A—End to End, Screwed	Inches	7¾	8	8¼	9½	10½	11¼	12¼	14	17	18½	22½	25½
$\frac{A}{2}$—Center to End, Screwed, Angle and Cross	Inches	3⅞	4	4⅛	4¾	5¼	5⅝	6⅛	7	8½	9¼	11¼	12¾
B—Face to Face, Flanged	Inches	9	10	11	12	13	13½	14½	16	17½	20	22½	25½
$\frac{B}{2}$—Center to Face, Flanged, Angle and Cross	Inches	4½	5	5½	6	6½	6¾	7¼	8	8¾	10	11¼	12¾
H—Diameter of Flanges	Inches	6½	7½	8¼	9	10	10½	11	12½	14	15	17½	20½
J—Thickness of Flanges	Inches	⅞	1	1⅛	1 3/16	1¼	1 5/16	1⅜	1 7/16	1½	1⅝	1⅞	2
R—Diameter of Wheel	Inches	6½	7½	9	10	10	12	12	14	14	16	20	20
T—Center to Top of Stem, Open	Inches	11¾	12⅝	14¼	15⅜	16⅜	17½	18¼	20¼	21⅝	24¼	28½	31
Y—Center to Outside of By-Pass	Inches								9¼	10	12	13¾	15¾
Size of By-Pass	Inches								1¼	1¼	1½	1½	2

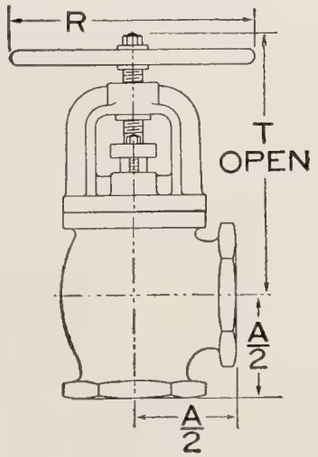
The heights from center of Valve to top of Stem in the above table are approximate only, but are accurate enough for figuring head room. They should not, however, be used to figure extended stems.

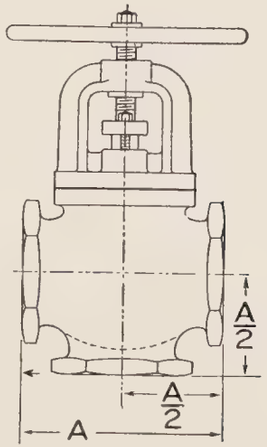
FOR DRILLING TEMPLATES, SEE PAGE 598

EXTRA HEAVY GLOBE, ANGLE AND CROSS VALVES

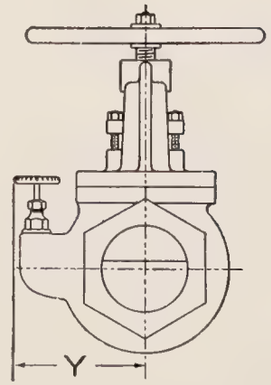
GENERAL DIMENSIONS

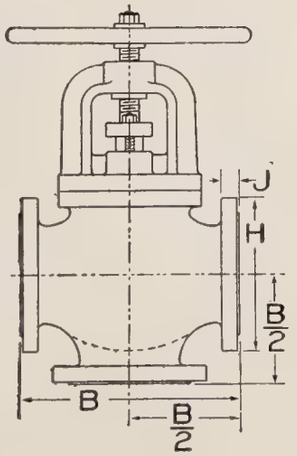
FERROSTEEL BODY

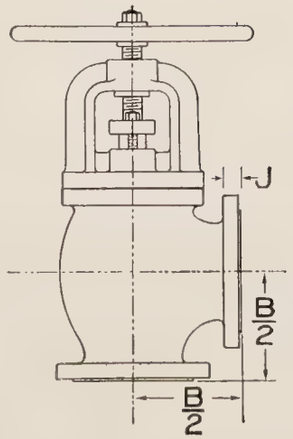


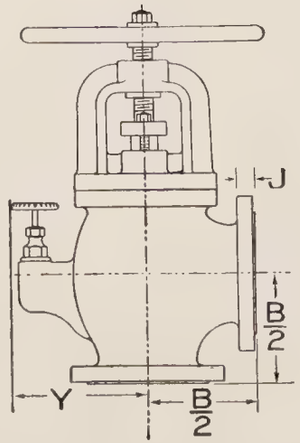


BRASS TRIMMINGS









FOR DIMENSION TABLE, SEE FOLLOWING PAGE

EXTRA HEAVY GLOBE, ANGLE AND CROSS VALVES

GENERAL DIMENSIONS

CATALOGUE Nos. 20E, 21E, 22E, 23E, 24E, 25E, 27E, 29E, 31E

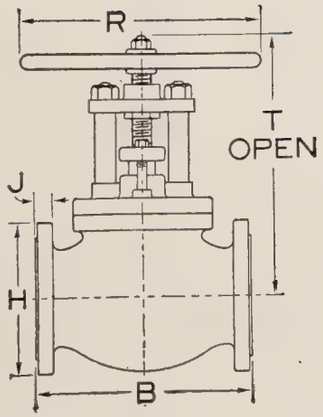
Size	Inches	2	2½	3	3½	4	4½	5	6	7	8	10	12	14	15
Size	Millimeters	50	64	76	90	100	113	125	150	175	200	250	300	350	375
A—End to End, Screwed	Inches	9½	10¾	11¾	12¼	13	14	15	16½						
A/2 Center to End, Screwed	Inches	4¾	5⅜	5⅞	6⅛	6½	7	7½	8¼						
B—Face to Face, Flanged	Inches	10½	11½	12½	13¼	14	15	15¾	17½	19¼	21	24½	28	33	33
B/2 Center to Face, Flanged	Inches	5¼	5¾	6¼	6⅝	7	7½	7⅞	8¾	9⅝	10½	12¼	14	16½	16½
H—Diameter of Flanges	Inches	6½	7½	8¼	9	10	10½	11	12½	14	15	17½	20½	23	24½
J—Thickness of Flanges	Inches	⅞	1	1⅛	1 3/16	1¼	1 5/16	1⅜	1 7/16	1½	1⅝	1⅞	2	2⅛	2 3/16
R—Diameter of Wheel	Inches	7½	9	10	10	12	12	14	16	18	20	24	30	36	36
T—Center to Top of Stem, Open	Inches	13¾	14½	17½	17½	19½	19½	21½	25	26¼	29½	34	39½	42	42
Y—Center to Outside of By-Pass, Angle and Cross	Inches								11⅜	11⅞	13⅜	14¾	17¼	19⅜	19⅜
Z—Center to Outside of By-Pass, Globe	Inches								11⅜	11⅞	13⅜	14¾	17¼	18¾	18¾
Size of By-Pass	Inches								1¼	1¼	1½	1½	2	2	2

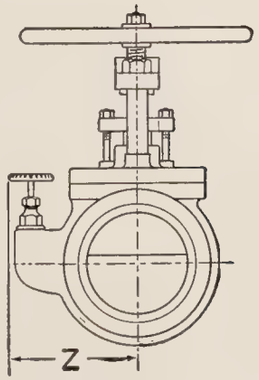
The heights from center of Valve to top of Stem in the above table are approximate only, but are accurate enough for figuring head room. They should not, however, be used to figure extended stems.

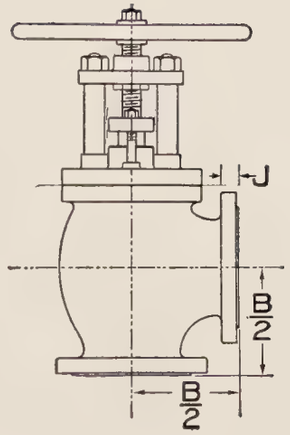
FOR DRILLING TEMPLATES, SEE PAGE 598

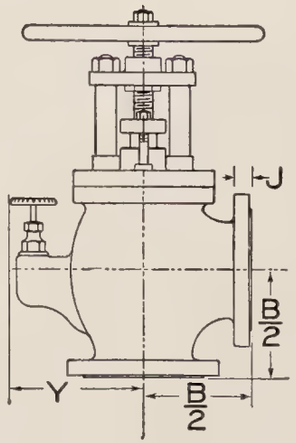
EXTRA HEAVY CAST STEEL GLOBE AND ANGLE VALVES

GENERAL DIMENSIONS









FOR DIMENSION TABLE, SEE FOLLOWING PAGE

EXTRA HEAVY CAST STEEL GLOBE AND ANGLE VALVES

GENERAL DIMENSIONS

CATALOGUE Nos. 21A, 21B, 21H, 27A, 27B, 23A, 23B, 23H, 29A, 29B

Size	Inches	2	2½	3	3½	4	4½	5	6	7	8	10	12	14	15
Size	Millimeters	50	64	76	90	100	113	125	150	175	200	250	300	350	375
B—Face to Face, Flanged	Inches	10½	11½	12½	13¼	14	15	15¾	17½	19¼	21	24½	28	33	33
$\frac{B}{2}$—Center to Face, Flanged	Inches	5¼	5¾	6¼	6⅝	7	7½	7⅞	8¾	9⅝	10½	12¼	14	16½	16½
H—Diameter of Flanges	Inches	6½	7½	8¼	9	10	10½	11	12½	14	15	17½	20½	23	24½
J—Thickness of Flanges	Inches	⅞	1	1⅛	1 3/16	1¼	1 5/16	1⅜	1 1/16	1½	1⅝	1⅞	2	2⅛	2 3/16
R—Diameter of Wheel	Inches	7½	9	10	10	12	12	14	16	18	20	24	30	36	36
T—Center to Top of Stem, Open	Inches	13¾	14½	17½	17½	19½	19½	21½	25	26¼	29½	34	39	42	42
Y—Center to Outside of By-Pass, Angle and Cross	Inches								11⅜	11⅞	13⅜	14¾	17¼	19⅜	19⅜
Z—Center to Outside of By-Pass, Globe	Inches								11⅜	11⅞	13⅜	14¾	17¼	18¾	18¾
Size of By-Pass	Inches								1¼	1¼	1½	1½	2	2	2

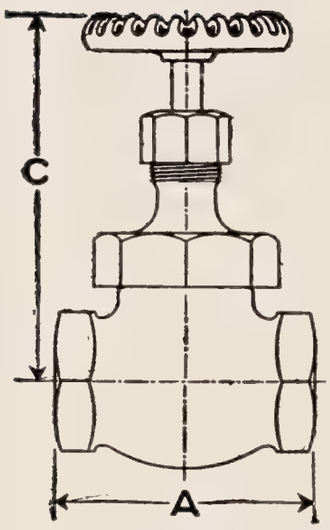
The heights from center of Valve to top of Stem in the above table are approximate only, but are accurate enough for figuring head room. They should not, however, be used to figure extended stems.

FOR DRILLING TEMPLATES, SEE PAGE 598

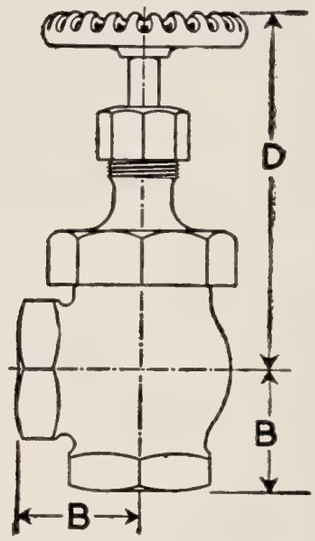
UNION BONNET

GLOBE, ANGLE AND CHECK VALVES

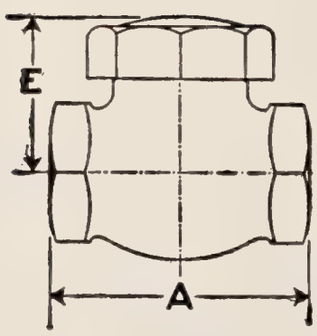
GENERAL DIMENSIONS



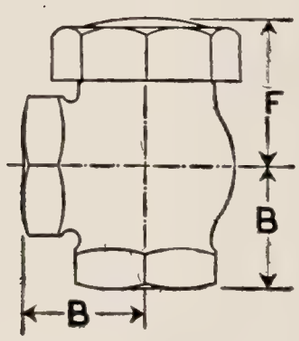
No. 350½
No. 354½, ALL IRON



No. 352½
No. 356½, ALL IRON



No. 366½



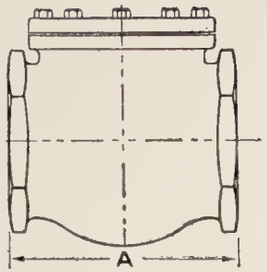
No. 367½

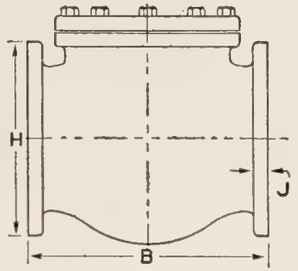
Size.....Inches	3/8	1/2	3/4	1	1 1/4	1 1/2	2
Size.....Millimeters	10	13	19	25	32	38	50
A—End to End.....Inches	2 5/8	3	3 1/2	4 1/8	4 5/8	5 1/4	6 3/8
B—Center to End.....Inches	1 1/4	1 13/32	1 19/32	1 7/8	2 3/16	2 13/32	3
C—Center to Top, Open, Globe Inches	4 1/2	5	5 5/8	6 3/8	7	7 3/4	9
D—Center to Top, Open, Angle Inches	4 3/8	4 7/8	5 1/2	6 1/8	6 7/8	7 1/2	8 3/4
E—Center to Top, Globe.....Inches	1 3/16	1 11/32	1 19/32	1 27/32	2 5/32	2 7/16	2 29/32
F—Center to Top, Angle.....Inches	1 1/8	1 1/4	1 1/2	1 3/4	2	2 1/4	2 21/32

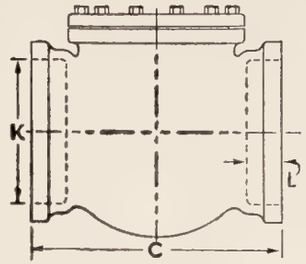
STANDARD CHECK VALVES

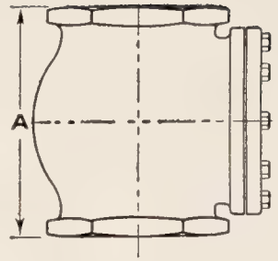
GENERAL DIMENSIONS

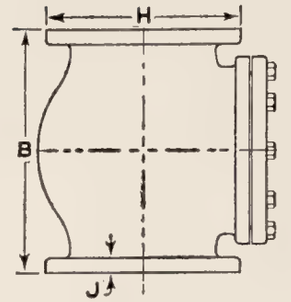
CATALOGUE Nos. 366, 367, 368, 369, 372, 373, 374











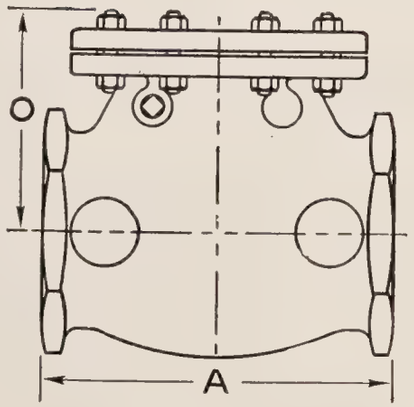
Size.....Inches	2	2½	3	3½	4	4½	5	6	7	8	10	12	14	15	16	18	20	24	30
Size.....Millimeters	50	64	76	90	100	113	125	150	175	200	250	300	350	375	400	450	500	600	750
A—End to End, Screwed, Nos. 366 and 368. Inches	6½	7	8	9	10	10½	11¼	13											
A—End to End, Screwed, No 372...Inches	6½	7	8	9	10	10¼	11¼	12½	14	16	18¾	21¼							
B—Face to Face, Flanged. Inches	8	8½	9½	10½	11½	12	13	14	16	19½	24½	27½	28	30	32	36	40	48	60
C—End to End, Hub.....Inches			10½		12		13	14		18	19	25	28½		30	32	35	40	50
H—Diameter of Flanges..Inches	6	7	7½	8½	9	9¼	10	11	12½	13½	16	19	21	22¼	23½	25	27½	32	38¾
J—Thickness of Flanges..Inches	5/8	11/16	3/4	13/16	15/16	15/16	15/16	1	1 1/16	1 1/8	1 3/16	1 1/4	1 3/8	1 3/8	1 7/16	1 9/16	1 11/16	1 7/8	2 1/8
K—Inside Diam. of Hub..Inches			4¾		5⅝		6¾	7⅞		10	12¼	14⅜	16½		18¾	20⅞	23	27¼	34
L—Depth of Hub.....Inches			2¾		3		3	3		3½	3½	3½	3½		4	4	4	4	4½

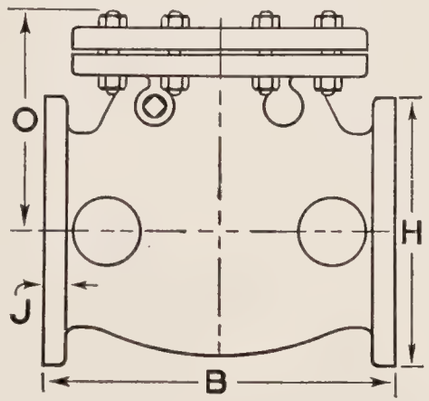
TEMPLATES FOR DRILLING, PAGE 596

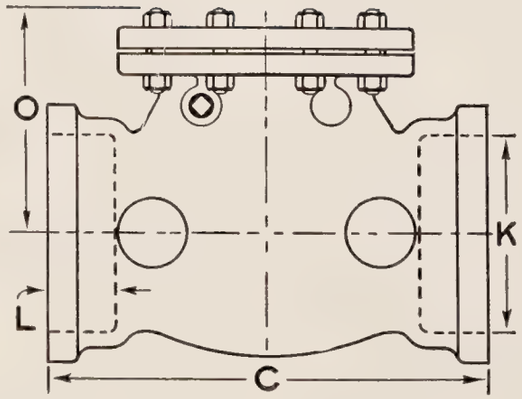
STANDARD CLEARWAY SWING CHECK VALVES

GENERAL DIMENSIONS

CATALOGUE Nos. 374½, 375, 375½







Size	Inches	2½	3	4	5	6	8	10	12
Size	Millimeters	64	76	100	125	150	200	250	300
A—End to End, Screwed	Inches	10	11	13	15	16	18		
B—Face to Face, Flanged	Inches	10	11	13	15	16	18	22	26
C—End to End, Hub End	Inches		14½	16½	18½	20	22¼	26	29½
H—Diameter Flanges	Inches	7	7½	9	10	11	13½	16	19
J—Thickness Flanges	Inches	11/16	3/4	15/16	15/16	1	1⅛	1 3/16	1¼
K—Inside Diameter Hub	Inches		4¾	5⅝	6¾	7⅞	10	12¼	14⅜
L—Depth of Hub	Inches		2¾	3	3	3	3½	3½	3½
O—Center to Cap Over All	Inches	6¼	6½	7⅜	8⅜	9⅛	11¼	13½	15¼

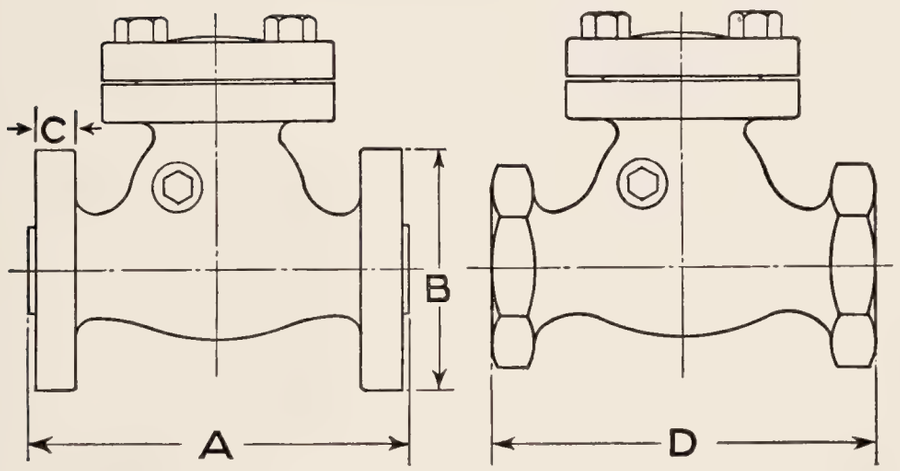
These dimensions are subject to a slight variation and change without notice.

TEMPLATES FOR DRILLING, PAGE 596

800-POUND

HYDRAULIC SWING CHECK VALVES

GENERAL DIMENSIONS



CATALOGUE Nos. 820 H AND 821 H

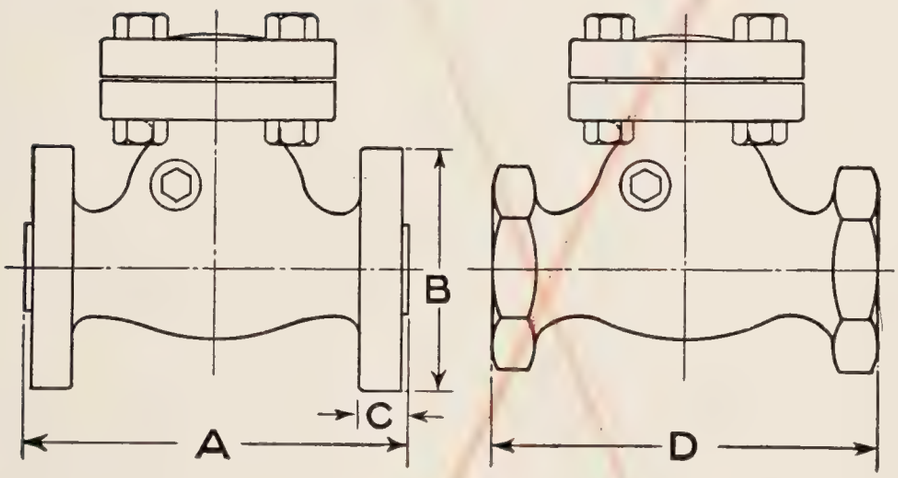
Size.....Inches	1½	2	2½	3	4	5	6	7	8	10	12
Size.....Millimeters	38	50	64	76	100	125	150	175	200	250	300
A—Face to Face, Flanged		12	13	14½	16½	18½	20½	22½	26½	30½	34½
B—Diameter of Flange . .	6	6¾	7½	8½	10¾	13	14	15	16½	20	22
C—Thickness of Flange.	13/16	1¼	1⅜	1½	1⅞	2⅛	2¼	2⅜	2½	2⅞	3
D—End to End, Screwed.		10½	12	13½	15¼	17¼	19				

Flange thickness does not include the ¼-inch male face.

800 POUND

HYDRAULIC SWING CHECK VALVES

GENERAL DIMENSIONS



CATALOGUE Nos. 820 H AND 821 H

Size	Inches	1½	2	2½	3	3½	4	4½
Size	Millimeters	38	50	64	76	90	100	113
A—End to End	Inches	9½	11½	13	14	15	17	18
B—Diameter of Flanges	Inches	6	6¾	7½	8½	9½	10¾	11½
C—Thickness of Flanges	Inches	1 1/16	1½	1⅝	1¾	1⅞	2⅛	2¼
D—End to End, Screwed	Inches	9½	11½	13	14	15	17	18

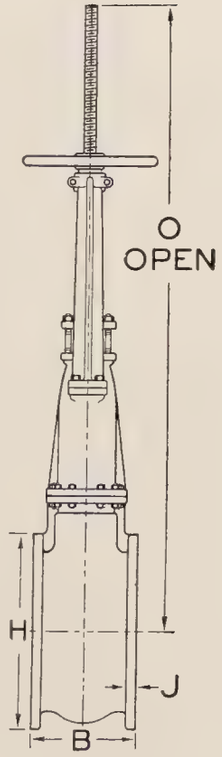
Size	Inches	5	6	7	8	10	12	
Size	Millimeters	125	150	175	200	250	300	
A—End to End	Inches	20	22	24	26	31	33	
B—Diameter of Flanges	Inches	13	14	15	16½	20	22	
C—Thickness of Flanges	Inches	2⅜	2½	2⅝	2¾	3⅛	3¼	
D—End to End, Screwed	Inches	20	22					

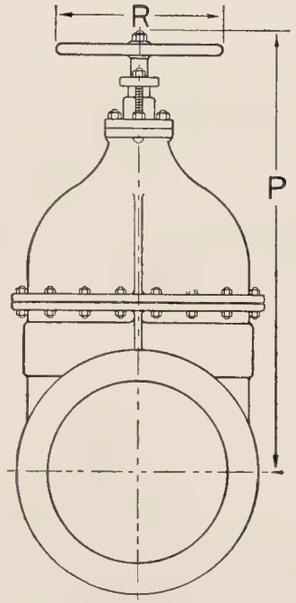
Flange thickness includes the ¼-inch male face.

LOW PRESSURE GATE VALVES

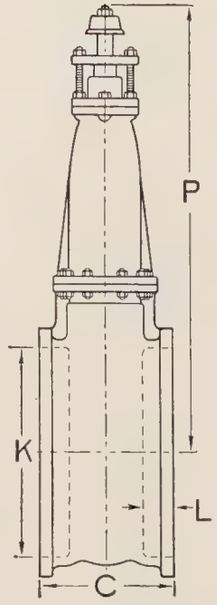
GENERAL DIMENSIONS

IRON BODY





BRASS TRIMMINGS



FOR DIMENSION TABLE, SEE FOLLOWING PAGE

GENERAL DIMENSIONS

CATALOGUE Nos. 491, 493, 498

Size.....Inches	4	6	8	10	12	14	15	16	18	20	22	24	26	28	30	32	34	36	40	42	48
Size.....Millimeters	100	150	200	250	300	350	375	400	450	500	550	600	650	700	750	800	850	900	1000	1050	1200
Face to Face, Flanged Inches					11	13½	13½	14	14½	15½	16½	17	18½	20	21	22	23	24	26	27	30
End to End, Hub End. Inches	8⅞	9⅜	11	11⅞	12½	13¼		14¾	16	16¾		17½			21¼			24		30	33
Diameter of Flanges. . Inches					19	21	22¼	23½	25	27½	29½	32	34¼	36½	38¾	41¾	43¾	46	50¾	53	59½
Thickness of Flanges. . Inches					1¼	1⅜	1⅜	1 7/16	1 9/16	1 11/16	1 13/16	1⅞	2	2 1/16	2⅛	2¼	2 5/16	2⅜	2½	2⅝	2¾
Inside Diameter of Hub. Inches	5⅝	7⅞	10	12¼	14⅜	16½		18¾	20⅞	23		27¼			34			40½		46¾	53
Depth of Hub.....Inches	3	3	3½	3½	3½	3½		4	4	4		4			4½			4½		5	5
Center to Top of Rising Stem, Open . . In.					58	64½	68	71½	79	87½	94½	105½	111½	122	126½	134½	144	150	172		
Center to Top of Non-Rising Stem . . . In.	15	18¾	23¼	27½	33	36½	38	40½	44	48½	51½	58	61	65	67½	71	76	80	93	102	114
Diameter of Wheel. . . . Inches					16	16	16	18	18	20	20	22	22	24	24	24	30	30	36		
Number of Turns to Open. . . .	13	13	17	21	25	29	31	33	37	41½	45½	49½	53½	57½	62	66	70	74			

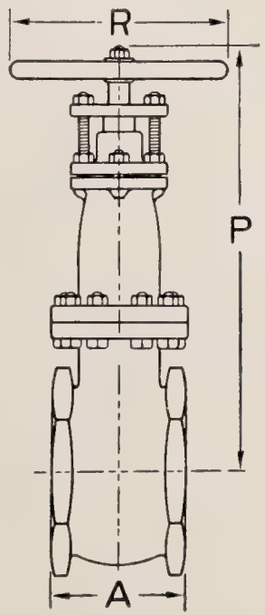
The heights from center of Valve to top of Stem in the above table are approximate only, but are accurate enough for figuring head room. They should not, however, be used to figure extended stems.

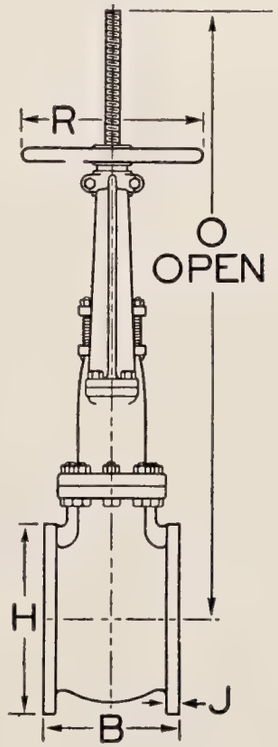
FOR DRILLING TEMPLATES, SEE PAGES 596 AND 597

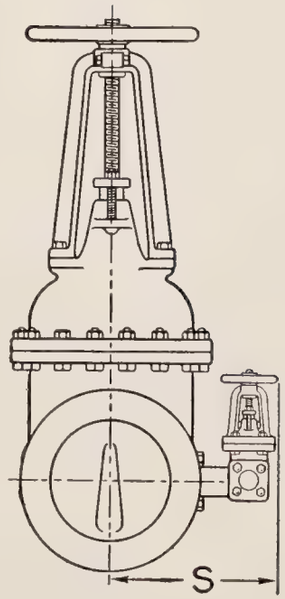
STANDARD GATE VALVES

GENERAL DIMENSIONS

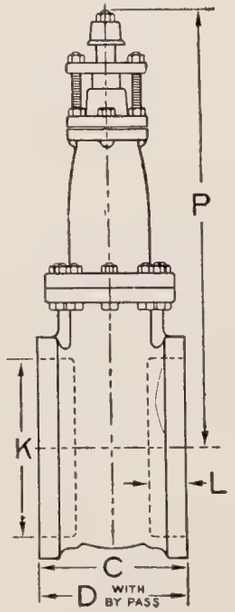
IRON BODY







BRASS TRIMMINGS



FOR DIMENSION TABLE, SEE FOLLOWING PAGE

STANDARD GATE VALVES

GENERAL DIMENSIONS

CATALOGUE Nos. 460, 461, 462, 462½, 464, 464½, 465, 465½, 467, 472, 473, 475, 475½

Size.....Inches	2	2½	3	3½	4	4½	5	6	7	8	9	10	12	14	15	16	18	20	22	24	26	28	30	36
Size..... Millimeters	50	64	76	90	100	113	125	150	175	200	225	250	300	350	375	400	450	500	550	600	650	700	750	900
E. to E., Screwed..... Inches	5 7/16	5 7/8	6 1/8	6 1/2	6 7/8	7 1/8	7 3/8	7 3/4	8 1/4	8 3/4	9 1/4	9 7/8	11 5/8											
F. to F., Flanged.....Inches	7	7½	8	8½	9	9½	10	10½	11	11½	12	13	14	15	15	16	17	18	19	20	23	26	30	36
E. to E., Hub End.....Inches	8½		9		10¼		10¼	10¾	10¾	12		12¾	13½	13¾		16	17	17		18	22	26	30	32
E.toE.Hub E. with By-PInches														16		19	20	21		22	22	26	30	32
Diameter Flanges.....Inches	6	7	7½	8½	9	9¼	10	11	12½	13½	15	16	19	21	22¼	23½	25	27½	29½	32	34¼	36½	38¾	46
Thickness of Flanges.....Inches	5/8	11/16	3/4	13/16	15/16	15/16	15/16	1	1 1/16	1 1/8	1 1/8	1 3/16	1 1/4	1 3/8	1 3/8	1 7/16	1 9/16	1 11/16	1 13/16	1 7/8	2	2 1/16	2 1/8	2 3/8
Inside Diameter of Hub.Inches	3¼		4¾		5⅝		6¾	7⅞	9	10		12¼	14⅜	16½		18¾	20⅞	23		27¼	29⅜	31½	34	40½
Depth of Hub.....Inches	2¾		2¾		3		3	3	3	3½		3½	3½	3½		4	4	4		4	4	4½	4½	4½
C.toT.of Rising Stem,Op.Inches	14½	16	18½	20¾	23½	24¾	28	31¾	37¼	41	45¼	49½	57½	66¾	69¾	75¼	83½	91¼	100	109	117½	125	133	158½
C.toT. of Non-Ris. Stem.Inches	12¼	12¾	14¾	15¼	16¼	17⅝	19	21¼	23½	26	28	31	36	39¼	41½	44¼	48¾	52½	57	63½	65⅞	70	75½	83
Diameter of Wheel.....Inches	6½	6½	7½	7½	9	9	10	12	12	14	14	16	18	20	20	22	24	24	27	30	30	36	36	
C. to Outside of By-Pass.Inches														19½	21	23¾	24¾	27¾	29	30½	32	33	34	39
Size of By-Pass.....Inches														2	2	3	3	4	4	4	4	4	4	6
Number of Turns to Open.....	6	7½	9½	11	8¾	10½	11	13¼	15	16½	19	21	25	30	31½	33¼	37	42¼	46	50	65	80	95	108

The heights from center of Valve to top of Stem in the above table are approximate only, but are accurate enough for figuring head room. They should not, however, be used to figure extended stems.

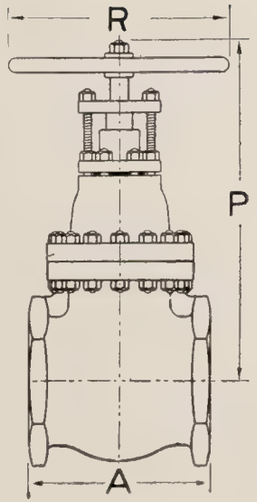
General dimensions of Valves larger than 36-inch will be furnished on application.

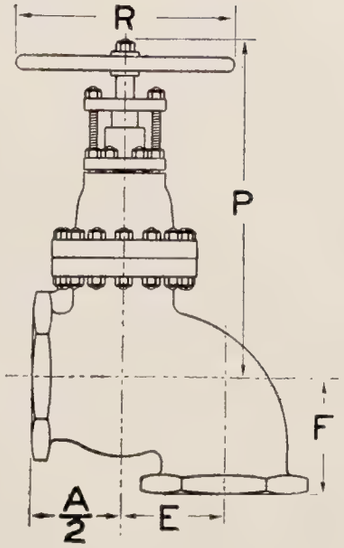
FOR DRILLING TEMPLATES, SEE PAGE 596

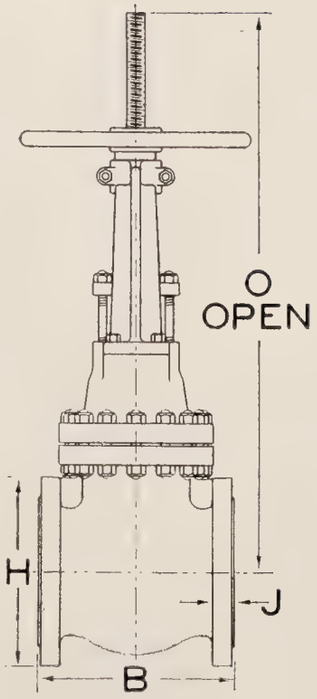
MEDIUM GATE VALVES

GENERAL DIMENSIONS

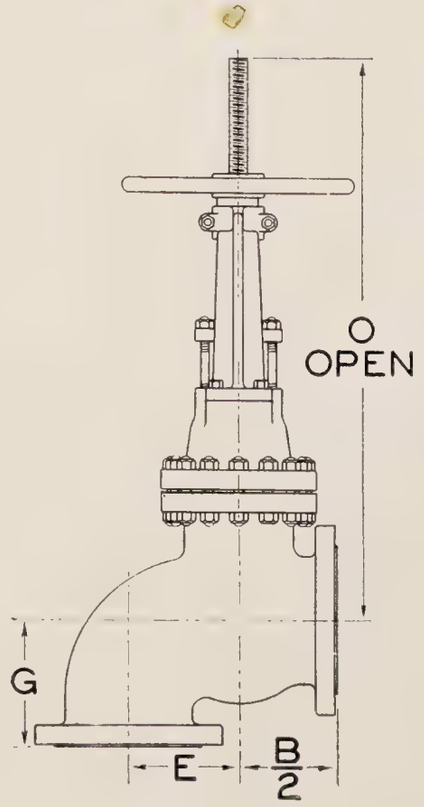
FERROSTEEL BODY







BRASS TRIMMINGS



FOR DIMENSION TABLE, SEE FOLLOWING PAGE

MEDIUM GATE VALVES

GENERAL DIMENSIONS

CATALOGUE Nos. 500, 501, 503, 504, 505, 507, 511, 513

Size.....Inches	2	2½	3	3½	4	4½	5	6	7	8	9	10	12	14	15	16	18	20	24
Size.....Millimeters	50	64	76	90	100	113	125	150	175	200	225	250	300	350	375	400	450	500	600
A—End to End, Screwed. Inches	5½	6	7¼	7½	7¾	8¼	8½	8¾	9¼	10	10¾	11½	12½						
A/2—Center to End, Screwed..... Inches	2¾	3	3 5/8	3¾	3 7/8	4 1/8	4¼	4 3/8	4 5/8	5	5 3/8	5¾	6¼						
B—Face to Face, Flanged. Inches	7½	8	9½	10	10½	11	11½	12	12½	13½	14	15	16	18	18¾	19½	21	22½	25½
B/2—Center to Face, Flanged..... Inches	3¾	4	4¾	5	5¼	5½	5¾	6	6¼	6¾	7	7½	8						
E—Center to Center, Angle..... Inches	3 1/8	3¾	4 7/16	5¼	5¾	6¼	6 5/8	7½	8½	9	9½	10¼	13						
F—Center to End, Screwed, Angle.. Inches	2¾	3¾	4	4½	5	5½	6	6½	7	7½	8	9	10						
G—Center to Face, Flanged, Angle.. Inches	3½	4¼	4 7/8	5½	6	6¾	7 5/8	8¼	8½	9	10½	11½	13						
H—Diameter of Flanges.. Inches	6½	7½	8¼	9	10	10½	11	12½	14	15	16¼	17½	20½	23	24½	25½	28	30½	36
J—Thickness of Flanges.. Inches	7/8	1	1 1/8	1 3/16	1¼	1 5/16	1 3/8	1 7/16	1½	1 5/8	1¾	1 7/8	2	2 1/8	2 3/16	2¼	2 3/8	2½	2¾
O—Center to Top of Rising Stem, Open. Inches	14	15½	18 3/8	20½	23¾	25	28 1/8	31 7/8	35¾	40¾	44¼	49¾	56 7/8	64½	68¾	74½	82¼	90¾	107
P—Center to Top of Non-Rising Stem. Inches	11 3/8	12 3/8	14¼	14¾	16¼	17	19	21 1/8	22 7/8	25 7/8	27½	30 1/8	33¾	38½	41	44¾	47 1/8	52	60
R—Diameter of Wheel... Inches	6½	6½	7½	7½	9	9	10	12	12	14	14	16	18	20	20	22	24	24	30
S—Center to Outside of By-Pass ... Inches								14 5/16	15 1/8	15 7/8	16 9/16	17 3/8	18 5/8	19¾	20½	22¾	24¼	27 9/16	30½
Size of By-Pass..... Inches								1¼	1¼	1½	1½	1½	2	2	2	3	3	4	4
Number of Turns to Open. Inches	6 3/8	7 7/8	9¾	11¼	9	10	11	25	30	34	38	42	50	59	64	67	76	84	101

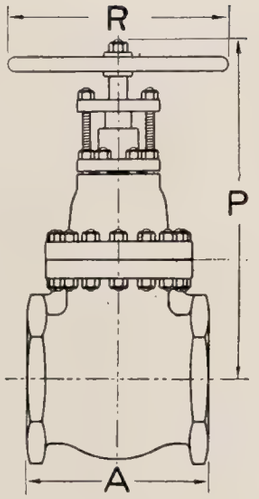
The height from center of Valve to top of Stem in the above table are approximate only, but are accurate enough for figuring head room. They should not, however, be used for figuring extended stems.

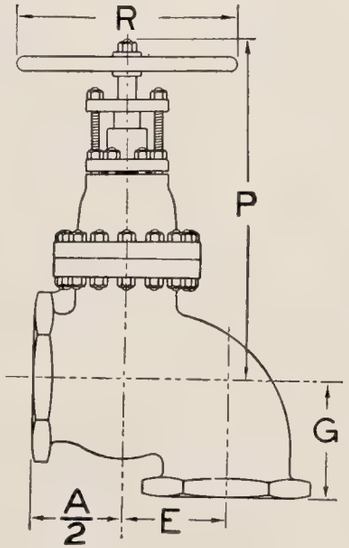
FOR DRILLING TEMPLATES, SEE PAGE 598

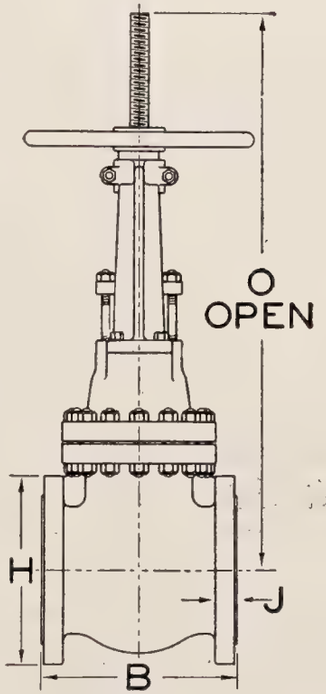
EXTRA HEAVY GATE VALVES

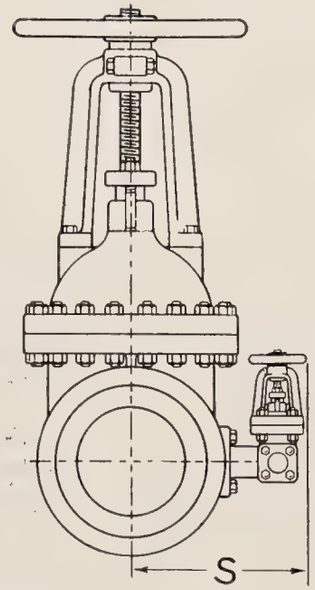
GENERAL DIMENSIONS

FERROSTEEL BODY

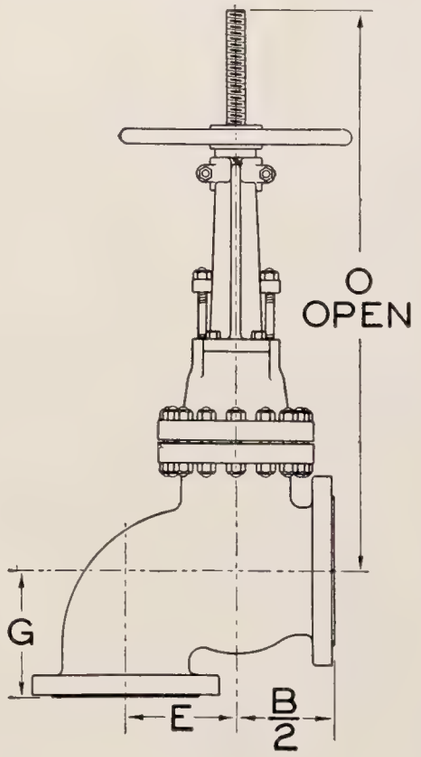








BRASS TRIMMINGS



FOR DIMENSION TABLE, SEE FOLLOWING PAGE

EXTRA HEAVY GATE VALVES

GENERAL DIMENSIONS

CATALOGUE Nos. 2 E, 3 E, 5 E, 6 E, 7 E, 7½ E, 9 E, 11 E, 12 E

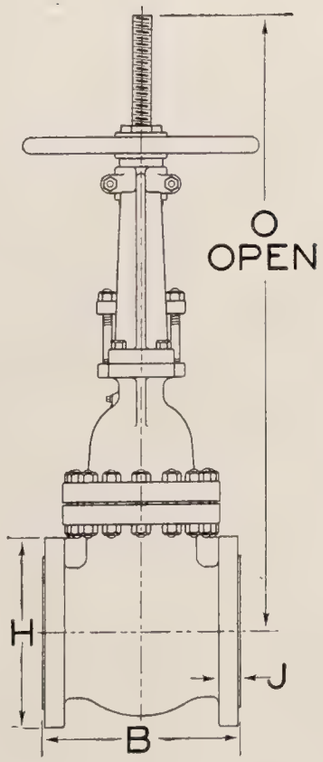
Size — Inches	1¼	1½	2	2½	3	3½	4	4½	5	6	7	8	9	10	12	14	15	16	18	20	22	24
Size — Millimeters	32	38	50	64	76	90	100	113	125	150	175	200	225	250	300	350	375	400	450	500	550	600
A—End to End, Screwed — Inches	5½	6¼	7	8	9	10	11	12¼	13½	15⅞	16¼	16½	17	18								
A/2—Center to End, Screwed — Inches	2¾	3⅛	3½	4	4½	5	5½	6⅛	6¾	7 15/16	8⅛	8¼	8½	9								
B—Face to Face, Flanged — Inches	6½	7½	8½	9½	11⅛	11⅞	12	13¼	15	15⅞	16¼	16½	17	18	19¾	22½	22½	24	26	28	29½	31
B/2—Center to Face, Flanged — Inches	3¼	3¾	4¼	4¾	5 9/16	5 15/16	6	6⅝	7½	7 15/16	8⅛	8¼	8½	9	9⅞							
E—Center to Center, Angle — Inches	2	2¼	3⅛	3¾	4 7/16	5¼	5¾	6¼	6⅝	7½	8½	9	9½	10¼	11¾							
G—Center to Face, Angle — Inches	2⅞	3¼	3½	4¼	4⅞	5½	6	6¾	7⅝	8¼	8¾	9⅝	10½	11½	13							
H—Diameter of Flanges — Inches	5	6	6½	7½	8¼	9	10	10½	11	12½	14	15	16¼	17½	20½	23	24½	25½	28	30½	33	36
J—Thickness of Flanges — Inches	¾	13/16	⅞	1	1⅛	1 3/16	1¼	1 5/16	1⅜	1 7/16	1½	1⅝	1¾	1⅞	2	2⅛	2 3/16	2¼	2⅜	2½	2⅝	2¾
O—Center to Top of Rising Stem, Open — Inches	10⅝	12¼	13¾	16	19½	22	24½	27	29¾	34⅛	38	42¾	47	52¾	60	67¾	67¾	75¼	82¼	91½	101	113
P—Center to Top of Non-Rising Stem — Inches	8¾	9⅝	10½	12⅞	14⅝	15½	17¾	18¾	20¼	23	24¾	28¾	30½	33¾	37¼	42¾	42¾					
R—Diameter of Wheel — Inches	5	5½	6½	7½	9	10	12	12	14	16	18	20	20	22	24	24	24	27	30	30	36	36
S—Center to Outside of By-Pass — Inches									12⅝	13	14⅛	15⅞	16⅜	16⅞	19⅞	20⅝	20⅝	25¼	26½	30½	32¼	33
Size of By-Pass — Inches									1¼	1¼	1¼	1½	1½	1½	2	2	2	3	3	4	4	4
Number of Turns to Open	12	11	14	15	14	16	18	21	23	28	30	34	40	39	46	52	52	60	67	74	82	88

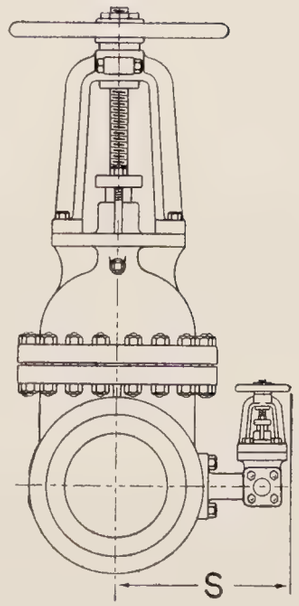
The heights from center of Valve to top of Stem in the above table are approximate only, but are accurate enough for figuring head room. They should not, however, be used for figuring extended stems.

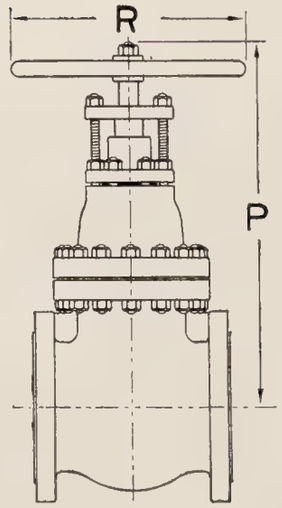
FOR DRILLING TEMPLATES, SEE PAGE 598

EXTRA HEAVY CAST STEEL GATE VALVES

GENERAL DIMENSIONS







FOR DIMENSION TABLE, SEE FOLLOWING PAGE

CAST STEEL GATE VALVES

GENERAL DIMENSIONS

CATALOGUE Nos. 3H, 5H, 7A, 7B, 7H, 9A, 9B, 9H

Size.....Ins.	1¼	1½	2	2½	3	3½	4	4½	5	6	7	8	9	10	12	14	15	16	18	20	24
Size.....Millimeters	32	38	50	64	76	90	100	113	125	150	175	200	225	250	300	350	375	400	450	500	600
B—Face to Face, Flanged...Ins.	6½	7½	8½	9½	11⅛	11⅞	12	13¼	15	15⅞	16¼	16½	17	18	19¾	22½	22½	24	26	28	31
H—Diameter of Flanges....Ins.	5	6	6½	7½	8¼	9	10	10½	11	12½	14	15	16¼	17½	20½	23	24½	25½	28	30½	36
J—Thickness of Flanges.....Ins.	¾	13/16	⅞	1	1⅛	1 3/16	1¼	1 5/16	1⅜	1 7/16	1½	1⅝	1¾	1⅞	2	2⅛	2 3/16	2¼	2⅜	2½	2¾
O—Center to Top of Rising Stem, Open. Ins.	12¾	14½	16	18½	22	25¼	28	29¾	33	38	41½	47	52¼	58½	65½	75	75	81	89	99	120
P—Center to Top of Non-Rising Stem..Ins.	8¾	9⅝	10½	12⅞	14⅝	15½	17¾	18¾	20¼	23	24¾	28¾	30½	33¾	37¼	42¾	42¾				
R—Diameter of Wheel.....Ins.	5	5½	6½	7½	9	10	12	12	14	16	18	20	20	22	24	24	24	27	30	30	36
S—Center to Outside of By-Pass .....Ins.										13	14⅛	15⅞	16⅜	16⅞	19⅞	20⅝	20⅝	25¼	26½	30½	33
Size of By-Pass.....Ins.										1¼	1¼	1½	1½	1½	2	2	2	3	3	4	4
Number of Turns to Open.....	14	12	15	15	14	17	19	21	24	28	32	35	40	39	46	54	54	57	64	76	89

The heights from center of Valve to top of Stem in the above table are approximate only, but are accurate enough for figuring head room. They should not, however, be used to figure extended stems.

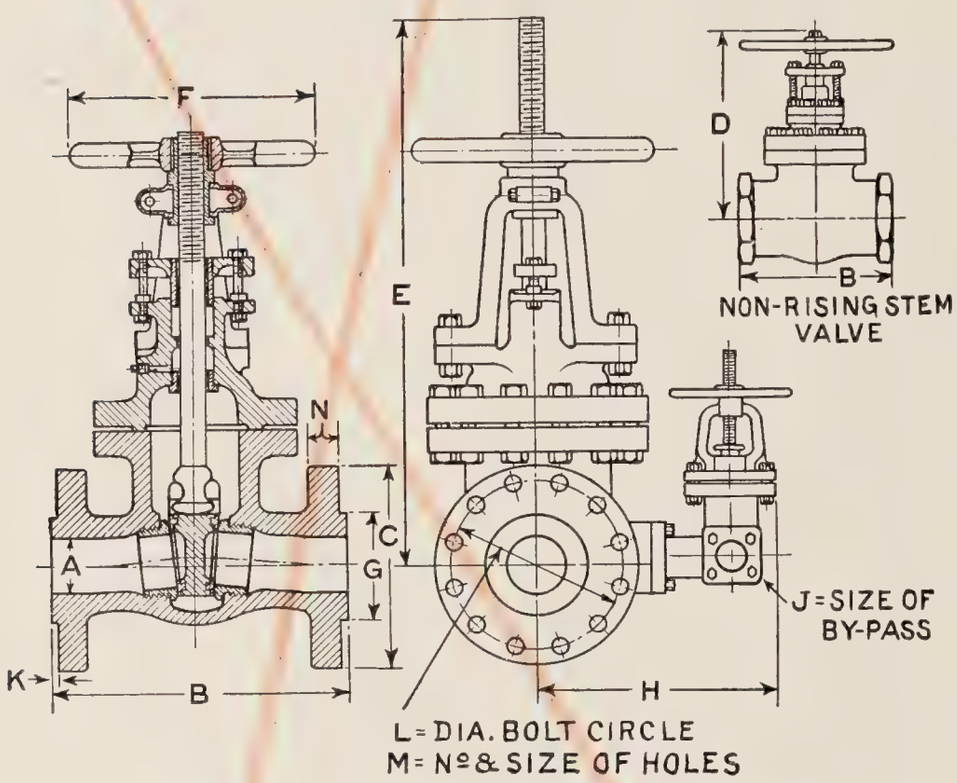
FOR DRILLING TEMPLATES, SEE PAGE 598

800-POUND

AMERICAN HYDRAULIC STANDARD GATE VALVES

GENERAL DIMENSIONS

CATALOGUE Nos. 804H, 805H, 807H



DIMENSIONS E, D, AND H ARE APPROXIMATE ONLY

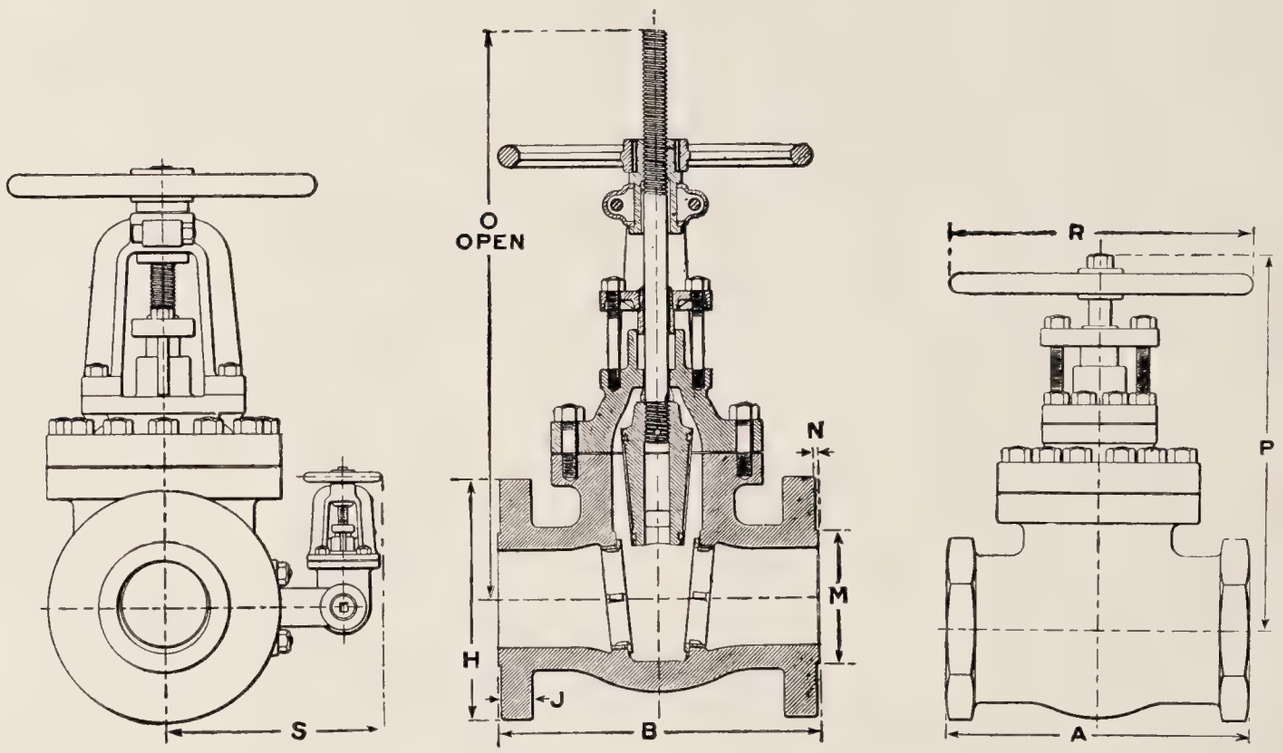
		A	B	C	D	E	F	G	H	J	K	L	M	N
Size Inches	Size Millimeters	Size Opening	Face to Face	Diam. of Flanges	Center to Top of Non-rising Stem	Center to top of Rising Stem	Diam. of Wheel	Diam. Male Faces	Center to Outside of By-Pass	Size of By-Pass	Height Male Face	Diam. Bolt Circle	Number and Size of Bolts	Thickness of Flanges
1½	38	1½	9½	6	13¼	18	7½	2⅞			¼	4½	4– ¾	13/16
2	50	2	11½	6¾	14½	19¼	9	3⅝			¼	5¼	4– ⅞	1¼
2½	64	2½	13	7½	16¼	22	10	4⅛			¼	5⅞	8– ⅞	1⅜
3	76	3	14	8½	18¼	25	12	5			¼	6½	8– ⅞	1½
3½	90	3½	15	9½	19¼	27	12	5½			¼	7½	8–1	1⅝
4	100	4	17	10¾	21¼	30	14	6 3/16			¼	8½	8–1	1⅞
4½	113	4½	18	11½	22¼	33	14	6¾			¼	9¼	8–1	2
5	125	5	20	13	24	36	16	7 5/16			¼	10½	8–1⅛	2⅛
6	150	6	22	14	27¾	40½	20	8½	18	1¼	¼	11½	12–1⅛	2¼
7	175	7	24	15		44	20	9⅝	19	1¼	¼	12½	12–1⅛	2⅜
8	200	8	26	16½		49	22	10⅝	21½	1½	¼	13¾	12–1¼	2½
10	250	10	31	20		59	24	12¾	23	1½	¼	17	16–1⅜	2⅞
12	300	12	33	22		70	30	15	27	2	¼	19¼	20–1⅜	3

Templates for drilling, page 599.

800-POUND HYDRAULIC GATE VALVES

GENERAL DIMENSIONS

CAT. NOS. 800-H, 801-H, 803-H, 804-H, 805-H AND 807-H

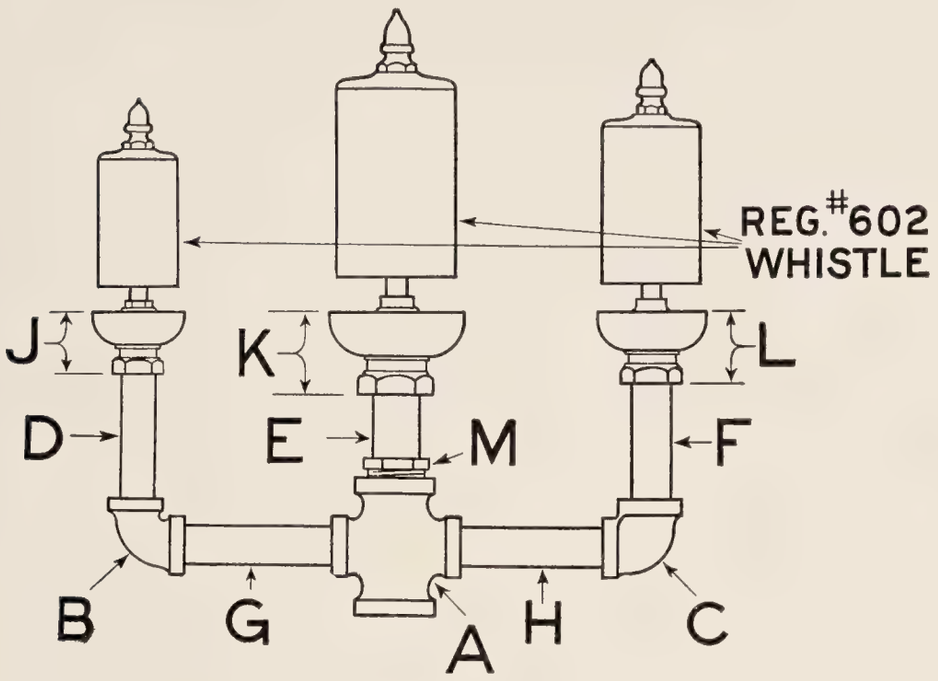


DIMENSIONS O, P AND S ARE APPROXIMATE ONLY

		A	B	H	J	M	N	O	P	R	S	
Size Inches	Size Millimeters	End to End Screwed	Face to Face Flanged	Diameter of Flanges	Thickness of Flange	Diameter of Male	Height of Male	Center to Top Rising Stem	Center to Top Non-Rising Stem	Diameter of Wheel	Center to Outside of By-Pass	Size of By-Pass
1½	38	10	10½	6	13/16	2⅞	¼	15⅛	12⅜	7½		
2	50	11½	12	6¾	1¼	3⅝	¼	18	14¼	10		
2½	64	13½	14	7½	1⅜	4⅛	¼	20½	16	12		
3	76	14½	15	8½	1½	5	¼	22⅞	17⅞	14		
3½	90	15½	16	9½	1⅝	5½	¼	25⅛	19¾	14		
4	100	16½	17	10¾	1⅞	6 3/16	¼	27⅜	21½	16		
4½	113	17½	18	11½	2	6¾	¼	29⅝	22⅜	16		
5	125	18½	19	13	2⅛	7 5/16	¼	31¾	23¼	18		
6	150	20	20½	14	2¼	8½	¼	35¾	24¾	20	14⅜	1¼
7	175	21½	22	15	2⅜	9⅝	¼	41¼	28¼	22	15	1¼
8	200	23	23½	16½	2½	10⅝	¼	45¼	29½	24	17⅜	1½
10	250	26½	27	20	2⅞	12¾	¼	53½	34⅝	27	18⅝	1½
12	300	29½	30	22	3	15	¼	62¼	40⅛	30	21½	2

Templates for drilling, page 599.

CHIME STEAM WHISTLES No. 606



DATA FOR PIPE AND FITTINGS

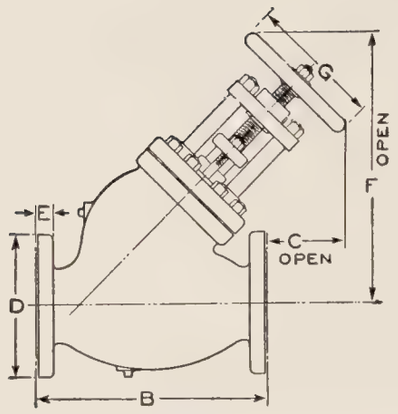
Size of Bell.....Inches	1½x2½x2	2x4x3	3x5x4	3½x5x4
A—Cross.....Inches	1x½	1½x¾	2x1¼	2x1¼
B—Ell.....Inches	⅜x½	½x¾	¾x1¼	1x1¼
C—Ell.....Inches	½	¾	1¼	1¼
D—Nipple.....Inches	⅜x2½	½x4½	¾x5	1x5
E—Nipple.....Inches	¾x2	1¼x3½	1½x4	1½x4
F—Nipple.....Inches	½x2½	¾x4	1¼x4½	1¼x4½
G—Nipple.....Inches	½x2½	¾x5	1¼x6	1¼x6
H—Nipple.....Inches	½x3	¾x5	1¼x6	1¼x6
J—Dim.....Inches	1 25/32	2⅛	2 9/16	3
K—Dim.....Inches	2¼	3 3/16	3⅝	3⅝
L—Dim.....Inches	2⅛	2 9/16	3 3/16	3 3/16
M—Bushing.....Inches	¾x1	1½x1¼	2x1½	2x1½
Size of Bell.....Inches	4x6x5	5x8x6	6x10x8	8x12x10
A—Cross.....Inches	2½x1½	3x2	3½x2½	4x3
B—Ell.....Inches	1¼x1½	2x1½	2½x2	3x2½
C—Ell.....Inches	1½	2	2½	3
D—Nipple.....Inches	1¼x5½	1½x7½	2x8	2½x5
E—Nipple.....Inches	2x5	2½x2½	3x6½	3x6
F—Nipple.....Inches	1½x5	2x7	2½x3	3x7
G—Nipple.....Inches	1½x8	2x10	2½x12	3x15
H—Nipple.....Inches	1½x8	2x10	2½x13	3x16
J—Dim.....Inches	3 3/16	3⅝	4¼	8½
K—Dim.....Inches	4¼	8½	4¾	7¼
L—Dim.....Inches	3⅝	4¼	8½	4¾
M—Bushing.....Inches	2½x2	3x2½	3½x3	4x3

EXTRA HEAVY

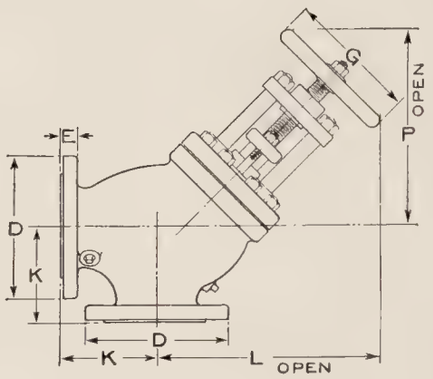
STOP CHECK VALVES

GENERAL DIMENSIONS

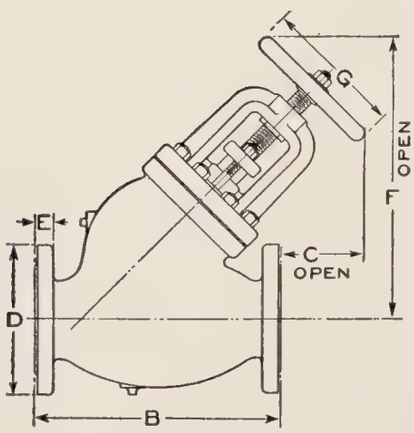
CATALOGUE Nos. 28E, 30E, 28A, 30A



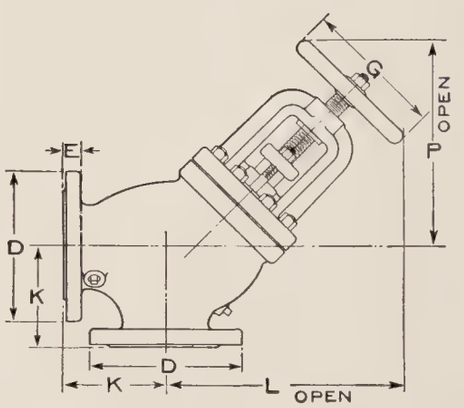
28 A



30 A



28 E



30 E

Size.....Inches	2½	3	4	5	6	7	8	10
Size.....Millimeters	64	76	100	125	150	175	200	250
B—Face to Face, Flanged, Straight.....Inches	13	14¾	17	19	21½	23½	26	30
C—F. of Flange to Rim of Wheel, Open, Straight..Inches	6	7	8	10¾	12	14½	16¼	20
D—Diameter of Flanges.....Inches	7½	8¼	10	11	12½	14	15	17½
E—Thickness of Flanges.....Inches	1	1⅛	1¼	1⅜	1 7/16	1½	1⅝	1⅞
F—Center to Top of Wheel, Open, Straight...Inches	17	19	23	26¾	29¾	33¾	36¾	44¼
G—Diameter of Wheel.....Inches	7½	9	10	14	16	18	20	24
K—Center to Face, Angle.....Inches	5¾	6¼	7	7⅞	8¾	9⅝	10½	12¼
L—Center to Rim of Wheel, Open, Angle.....Inches	14	16½	18	22½	26	29	33	40
P—Center to Rim of Wheel, Open, Angle.....Inches	12½	14½	16½	19½	23	26	28	35

The Flanges of these Valves are regularly furnished with a raised face 1/16-inch high inside the bolt holes.

For drilling templates, see page 598.

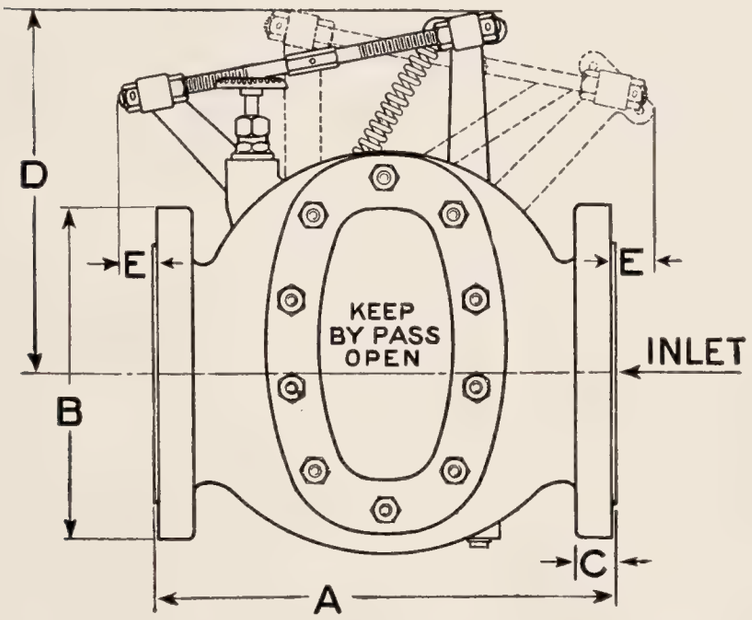
CRANE-ERWOOD

AUTOMATIC DOUBLE ACTING

NON-RETURN AND EMERGENCY CUT-OUT VALVES

GENERAL DIMENSIONS

CATALOGUE Nos. 36E, 37E, 36A, 37A



Size.....Inches	4	5	6	7	8	10
Size.....Millimeters	100	125	150	175	200	250
A—Face to Face.....Inches	14	15¾	17½	19¼	21	24½
B—Diameter of Flanges.....Inches	10	11	12½	14	15	17½
C—Thickness of Flanges.....Inches	1¼	1⅜	1⁷⁄₁₆	1½	1⅝	1⅞
D—Center to Top of Lever....Inches	11¼	11¾	13	14	15	17⅝
E—Overhang of Lever.....Inches	1½	1¾	1½	1¾	1¾	1½

For drilling templates, see page 598.

GENERAL DIMENSIONS

COMBINATION BACK PRESSURE AND EXHAUST RELIEF VALVES

STAY OPEN TYPE—CATALOGUE No. 415-H, A & V

FLANGED VALVES

Size Inches	Size Millimeters	Face to Face Horizontal or Vertical—In.	Center to Face of Inlet or Outlet, Inches		Diameter of Flanges Inches	Thickness of Flanges Inches
			Angle	Down Discharge		
4	100	11½	5¾	5½	9	15/16
4½	113	12	6	6	9¼	15/16
5	125	13	6½	6½	10	15/16
6	150	14	7	7	11	1
7	175	16	8	8	12½	1 1/16
8	200	19½	9¾	9¾	13½	1 1/8
9	225	18	9¼	9¼	15	1 1/8
10	250	24½	12¼	12¼	16	1 3/16
12	300	27½	13¾	13¾	19	1¼
14	350	28	14	14	21	1 3/8
15	375	30			22¼	1 3/8
16	400	32	16	16	23½	1 7/16
18	450	36	18	18	25	1 9/16
20	500	40	20	20	27½	1 11/16
22	550	44	22	22	29½	1 13/16
24	600	48	24	24	32	1 7/8
26	650	52	26	26	34¼	2
28	700	56	28	28	36½	2 1/16
30	750	60	30	30	38¾	2 1/8
36	900	72	36	36	46	2 3/8

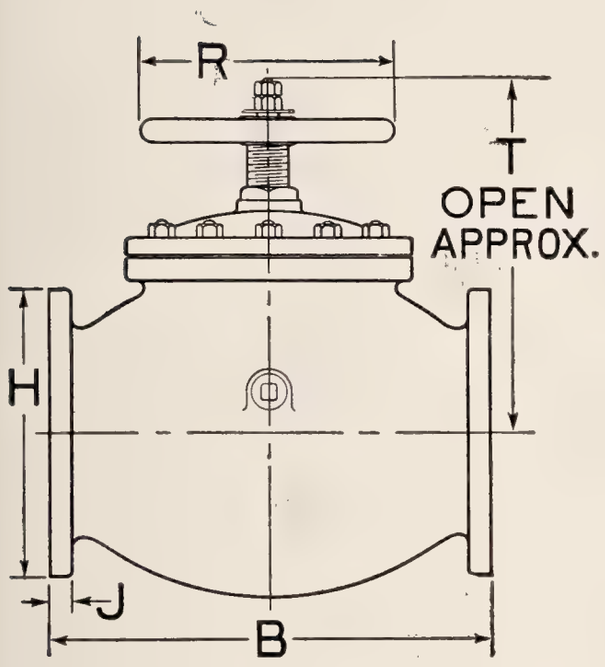
Templates for drilling, page 596.

BACK PRESSURE AND EXHAUST RELIEF VALVES

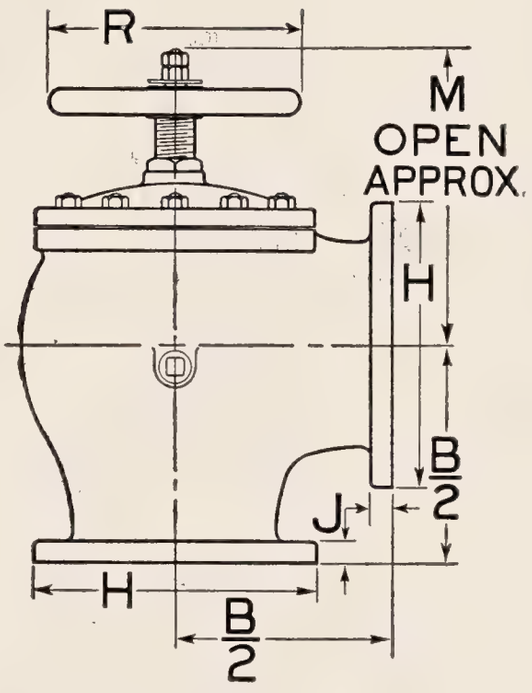
SPRING LOADED TYPE

IRON BODY BRASS SEAT AND DISC

GENERAL DIMENSIONS



No. 386-H. HORIZONTAL



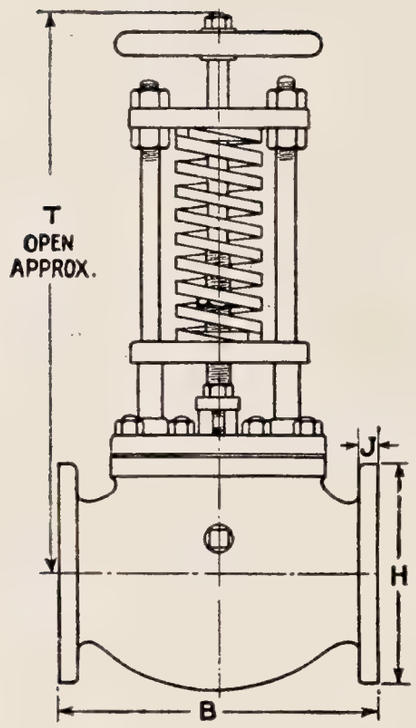
No. 386-A. ANGLE

Size Inches	Size Millimeters	B	H	J	M	R	T
2½	64	9½	7	11/16	7½	5	8½
3	76	10	7½	¾	8½	6½	9½
3½	90	11	8½	13/16	9	6½	10
4	100	12	9	15/16	10½	7½	11½
4½	113	13	9¼	15/16	11	7½	12
5	125	14	10	15/16	11½	9	13
6	150	16	11	1	13	9	14½
7	175	18	12½	1 1/16	15	10	17
8	200	19½	13½	1 ⅛	15½	10	18½
10	250	24½	16	1 3/16	18½	14	22
12	300	27½	19	1¼	21	14	24

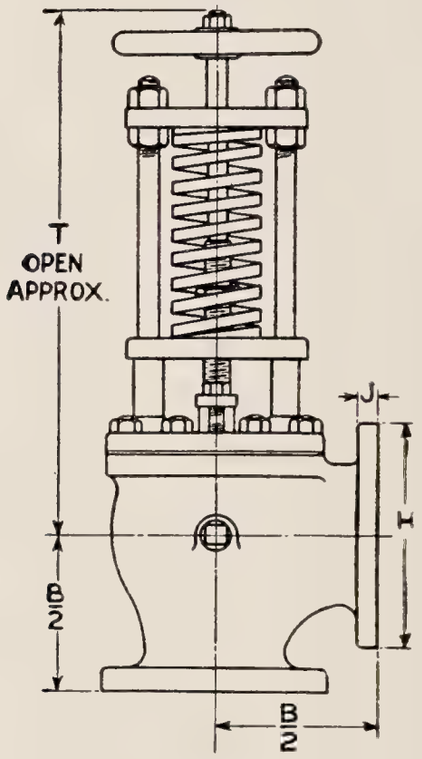
FOR DRILLING TEMPLATES, SEE PAGE 596

BACK PRESSURE VALVES

HORIZONTAL OR ANGLE



No. 4387
HORIZONTAL



No. 4389
ANGLE

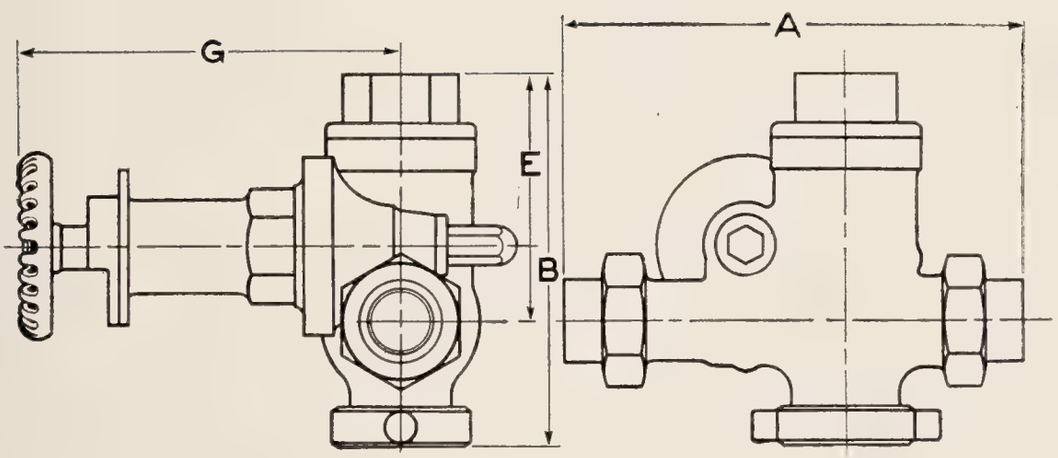
DIMENSIONS

Size.....Inches	2½	3	3½	4	4½	5	6	7	8	10	12
Size.....Millimeters	64	76	90	100	113	125	150	175	200	250	300
B—Face to Face....Inches	9½	10	11	12	13	14	16	18	19½	24½	27½
$\frac{B}{2}$—Center to Face..Inches	4¾	5	5½	6	6½	7	8	9	9¾	12¼	13¾
H—Diameter of Flanges In.	7	7½	8½	9	9¼	10	11	12½	13½	16	19
J—Thickness of Flanges In.	11/16	¾	13/16	15/16	15/16	15/16	1	1 1/16	1 1/8	1 3/16	1¼
T—Center to Top, Open, (Approx.).Ins.	14	16	18½	21	23	25½	28	30½	34	40	46

Templates for drilling, page 596.

PRESSURE REGULATORS

GENERAL DIMENSIONS



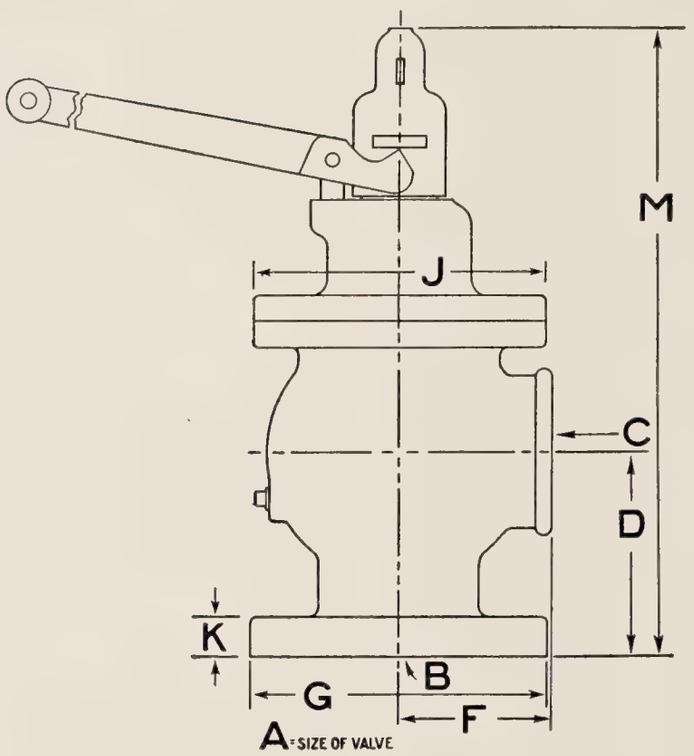
No. 960

Size	Inches	1/2	3/4	1	1 1/4	1 1/2	2
Size	Millimeters	13	19	25	32	38	50
A—End to End	Inches	7 7/16	8 3/8	9 1/8	9 3/4	10 3/4	12 1/8
B—Top to Bottom, Over all	Inches	6	6	6 3/4	7 3/8	8 5/8	9 3/4
E—Center to Top	Inches	3 7/8	3 7/8	4 3/8	4 7/8	5 5/8	6 1/4
G—Center to Outside of Pilot Valve	Inches	6 1/4	6 1/4	7 1/4	7 1/2	7 5/8	7 1/2

IRON BODY POP SAFETY VALVES

(CRANE PATENT)

GENERAL DIMENSIONS



No. 1101

A—Size of Valve	Inches	2½	3	3½	4	4½
A—Size of Valve	Millimeters	64	76	90	100	113
B—Size of Inlet	Inches	2½	3	3½	4	4½
C—Size of Outlet	Inches	2½	3	3½	4	4½
D—Center to Face of Inlet	Inches	5¼	5¾	6⅜	6¹¹⁄₁₆	7⅛
F—Center to End of Outlet, Screwed	Inches	3⅞	4¼	4⅝	5	6
G—Diameter of Inlet Flange	Inches	7½	8¼	9	10	10½
J—Diameter of Bonnet Flange	Inches	7⅜	8⅛	8¾	9½	11
K—Thickness of Inlet Flange	Inches	1	1⅛	1³⁄₁₆	1¼	1⁵⁄₁₆
M—Height Over All	Inches	16¼	17¾	20⅛	21¼	22⅝

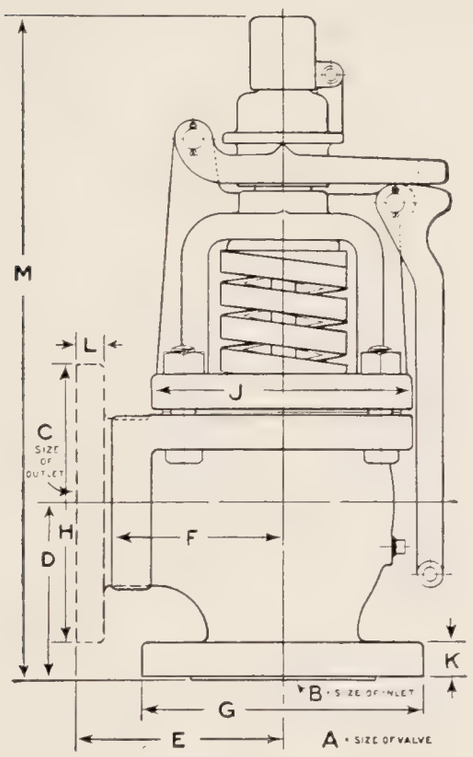
An additional charge will be made for special-diameter flanges. Drilling extra. For Price List, see page 484.

Templates for drilling should always accompany orders, otherwise we will drill the base (inlet) flange according to Extra Heavy Templates, page 598.

OUTSIDE SPRING AND YOKE POP SAFETY VALVES

(CRANE PATENT)

GENERAL DIMENSIONS



No. 1116
No. 1117

A—Size of Valve	Inches	1½	2	2½	3	3½	4	4½
A—Size of Valve	Millimeters	38	50	64	76	90	100	113
B—Size of Inlet	Inches	1½	2	2½	3	3½	4	4½
C—Size of Outlet	Inches	2	2½	3	3½	4	4½	5
D—Center to Face of Inlet	Inches	3 5/16	4 3/8	4 3/4	5 3/8	6	6½	7 1/8
E—Center to Face of Outlet	Inches		4 3/4	5½	6	6½	7	7½
F—Center to End of Outlet	Inches	3	3 15/16	4½	4 7/8	5 7/16	5 3/4	6 3/16
G—Diameter of Inlet Flange	Inches	4 11/16*	6½	7½	8¼	9	10	10½
H—Diameter of Outlet Flange	Inches		7	7½	8½	9	9¼	10
J—Bonnet Flange	Inches	4¼	5 7/8	7	7½	8½	9 1/8	9 15/16
K—Thickness of Inlet Flange	Inches	7/8	7/8	1	1 1/8	1 3/16	1¼	1 5/16
L—Thickness of Outlet Flange	Inches		11/16	3/4	13/16	15/16	15/16	15/16
M—Height Over All	Inches	12½	16½	18 3/4	21¼	22 3/4	24 3/4	27

*The inlet flange of the 1½-inch size is square.

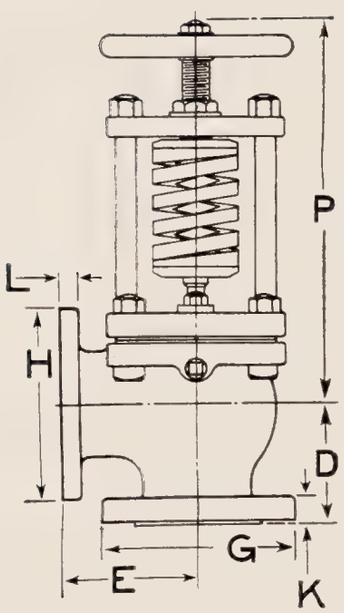
An additional charge will be made for special-diameter flanges. Drilling extra.

Templates for drilling should always accompany orders, otherwise we will drill the base (inlet) flange according to Extra Heavy Templates, page 598 and the outlet flange according to Standard Templates, page 596.

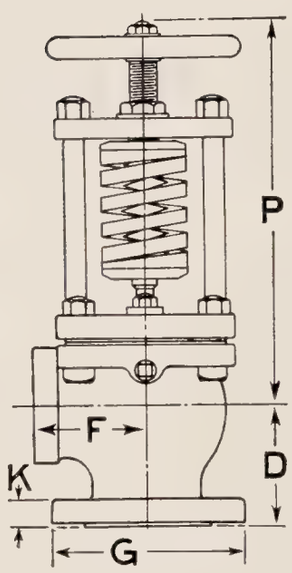
OUTSIDE SPRING AND YOKE

IRON BODY RELIEF VALVES

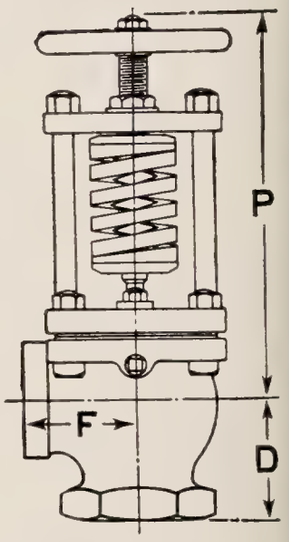
GENERAL DIMENSIONS



No. 1113



No. 1114

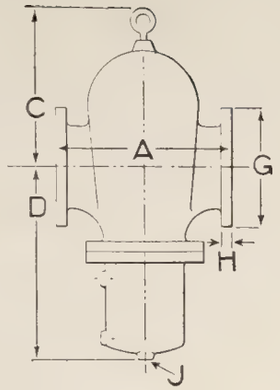


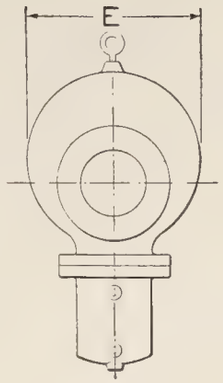
No. 1115

A—Size of Valve.....Inches	1½	2	2½	3	3½	4	4½
A—Size of Valve.....Millimeters	38	50	64	76	90	100	113
B—Size of Inlet.....Inches	1½	2	2½	3	3½	4	4½
C—Size of Outlet.....Inches	2	2½	3	3½	4	4½	5
D	3 5/16	4 3/8	4 3/4	5 3/8	6	6½	7 1/8
E	4 3/8	4 3/4	5½	6	6½	7	7½
F	3	3 15/16	4½	4 7/8	5 9/16	6	6½
G	4 11/16	6½	7½	8¼	9	10	10½
H	6	7	7½	8½	9	9¼	10
K	7/8	7/8	1	1 1/8	1 3/16	1¼	1 5/16
L	5/8	11/16	3/4	13/16	15/16	15/16	15/16
P	13½	14¾	16¾	19	21	23	25

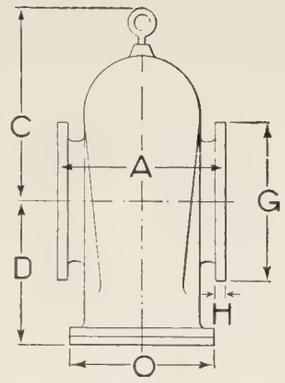
LOW PRESSURE OIL SEPARATORS

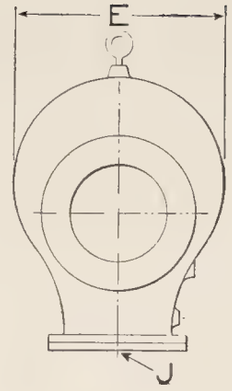
GENERAL DIMENSIONS



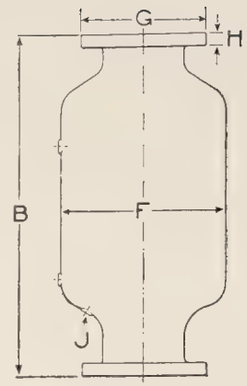


No. 01
10-INCH AND SMALLER





No. 03
12-INCH AND LARGER



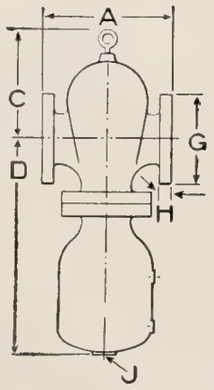
No. 05
1½ TO 12-INCH, INCLUSIVE

Size.....Inches	1½	2	2½	3	3½	4	4½	5	6	7	8	9	10	12	14	15	16	18	20	22	24	26	28	30	36
Size.....Millimeters	38	50	64	76	90	100	113	125	150	175	200	225	250	300	350	375	400	450	500	550	600	650	700	750	900
A—Facet o Face, Horizontal.....Inches	10	10	11	12	14	14	16	16	17	20	20	23	23	20	23	25	25	27	30	32	34	36	38	40	46
B—Face to Face, Vertical.....Inches	27	27	27	29	31	31	33	33	38	41	41	44	44	47											
C—Center to Top, Horizontal.....Inches	4	4½	5¼	9½	11	10½	12¾	12¾	15	18	17¾	22	22	23¾	26¼	28½	28½	32½	34¼	37¼	40¼	44¾	47¾	50½	58¼
D—Center to Bottom, Horizontal.....Inches	15	15	15½	16	16½	17¼	18½	18½	19½	20	21½	23½	23½	17½	20	22¼	22¼	24¼	27½	29½	30	31	32¼	33¼	40¼
E—Diameter of Head, Horizontal.....Inches	6⅜	7½	8¼	9½	11½	11½	15	15	16½	21	21	25	25	27¼	31	33¾	33¾	39	42¼	46½	50½	54½	58½	63	81¾
F—Diameter of Body, Vertical.....Inches	11	11	11	12	14	14	16	16	17	20	20	23½	23½	27											
G—Diameter of Flanges.....Inches	5	6	7	7½	8½	9	9¼	10	11	12½	13½	15	16	19	21	22¼	23½	25	27½	29½	32	34¼	36½	38¾	46
H—Thickness of Flanges.....Inches	9/16	5/8	11/16	3/4	13/16	15/16	15/16	15/16	1	1 1/16	1 1/8	1 1/8	1 3/16	1 1/4	1 3/8	1 3/8	1 7/16	1 9/16	1 11/16	1 13/16	1 7/8	2	2 1/16	2 1/8	2 3/8
J—Size of Drain.....Inches	½	½	¾	1	1	1	1¼	1¼	1¼	1¼	1¼	1½	1½	1½	2	2	2	2	2½	2½	2½	3	3	3	3

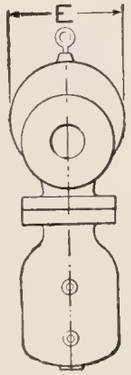
FOR DRILLING TEMPLATES, SEE PAGE 596

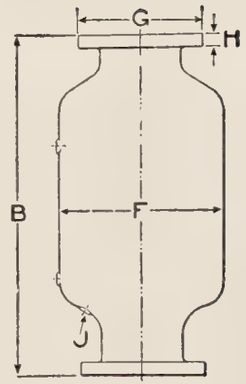
STANDARD STEAM SEPARATORS

GENERAL DIMENSIONS



No. 07





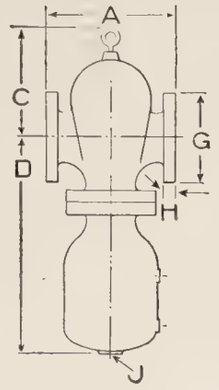
No. 09

Size	Inches	1½	2	2½	3	3½	4	4½	5	6	7	8	9	10	12
Size	Millimeters	38	50	64	76	90	100	113	125	150	175	200	225	250	300
A—Face to Face, Horizontal	Inches	10	10	11	12	14	14	16	16	17	20	20	23	23	26
B—Face to Face, Vertical	Inches	27	27	27	29	31	31	33	33	38	41	41	44	44	47
C—Center to Top, Horizontal	Inches	4	4½	5¼	9½	11	10½	12¾	12¾	15	18	17¾	22	22	26½
D—Center to Bottom, Horizontal	Inches	17	17	18½	20¼	23	23¼	26	26¼	28¾	34¼	34½	39½	39½	45
E—Diameter of Head, Horizontal	Inches	6⅜	7½	8¼	9½	11½	11½	15	15	16½	21	21	25	25	29
F—Diameter of Body, Vertical	Inches	11	11	11	12	14	14	16	16	17	20	20	23½	23½	27
G—Diameter of Flanges	Inches	5	6	7	7½	8½	9	9¼	10	11	12½	13½	15	16	19
H—Thickness of Flanges	Inches	9/16	5/8	11/16	3/4	13/16	15/16	15/16	15/16	1	1 1/16	1 1/8	1 1/8	1 3/16	1¼
J—Size of Drain	Inches	½	½	¾	1	1	1	1¼	1¼	1¼	1¼	1¼	1½	1½	1½

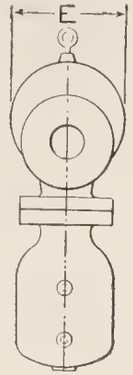
FOR DRILLING TEMPLATES, SEE PAGE 596

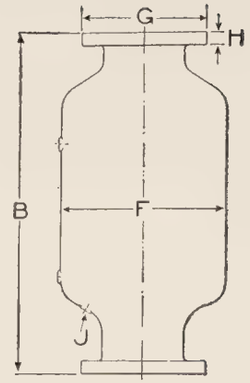
EXTRA HEAVY STEAM SEPARATORS

GENERAL DIMENSIONS



No. 011





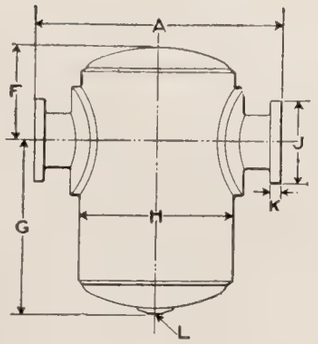
No. 013

Size	Inches	1½	2	2½	3	3½	4	4½	5	6	7	8	9	10	12
Size	Millimeters	38	50	64	76	90	100	113	125	150	175	200	225	250	300
A—Face to Face, Horizontal	Inches	10	10	11	12	14	14	16	16	17	20	20	23	23	26
B—Face to Face, Vertical	Inches	27	27	27	29	31	31	33	33	38	41	41	44	44	47
C—Center to Top, Horizontal	Inches	4	4¾	5½	9½	11	11¼	12¾	12¾	15	18	18	22	22	26½
D—Center to Bottom, Horizontal	Inches	17	17	18½	20¼	23	23¼	26	26¼	28¾	34¼	34¼	39½	39½	45
E—Diameter of Head, Horizontal	Inches	6⅝	7¾	8¾	9½	11½	12	15	15	16½	21	21	25	25	29
F—Diameter of Body, Vertical	Inches	11	11	11	12½	14	14	16	16	17½	20	20	23½	23½	27
G—Diameter of Flanges	Inches	6	6½	7½	8¼	9	10	10½	11	12½	14	15	16¼	17½	20½
H—Thickness of Flanges	Inches	13/16	⅞	1	1⅛	1 3/16	1¼	1 5/16	1⅜	1 7/16	1½	1⅝	1¾	1⅞	2
J—Size of Drain	Inches	½	½	¾	1	1	1	1¼	1¼	1¼	1¼	1¼	1½	1½	1½

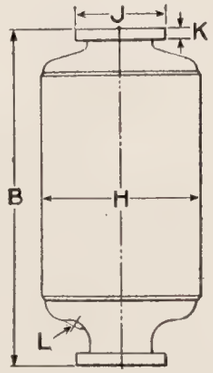
For drilling Templates, see page 598.

EXTRA HEAVY RECEIVER STEAM SEPARATORS

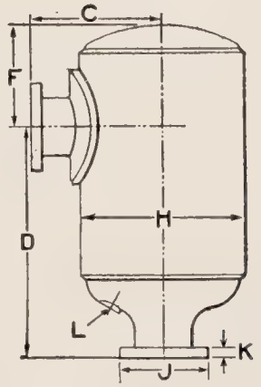
GENERAL DIMENSIONS



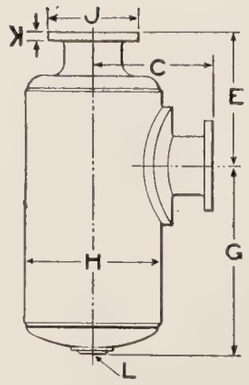
No. 014



No. 017



No. 019



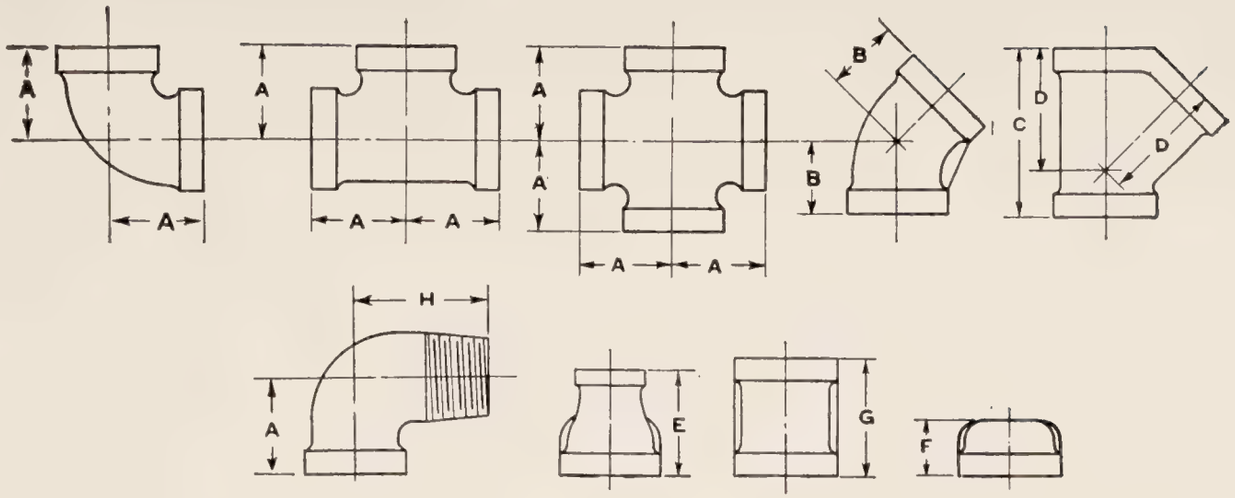
No. 020

Size.....Inches	4	4½	5	6	7	8	9	10	12	14	15	16	18	20
Size.....Millimeters	100	113	125	150	175	200	225	250	300	350	375	400	450	500
A—Face to Face, Horizontal.....Inches														
B—Face to Face, Vertical.....Inches														
C—Center to Side Face, Angle.....Inches														
D—Center to Bottom Face, Angle...Inches														
E—Center to Top Face, Angle.....Inches					DIMENSIONS ON REQUEST									
F—Center to Top.....Inches														
G—Center to Bottom.....Inches														
H—Diameter of Body.....Inches														
J—Diameter of Flanges.....Inches														
K—Thickness of Flanges.....Inches														
L—Size of Drain.....Inches														

FOR DRILLING TEMPLATES, SEE PAGE 598

STANDARD BRASS SCREWED FITTINGS

GENERAL DIMENSIONS

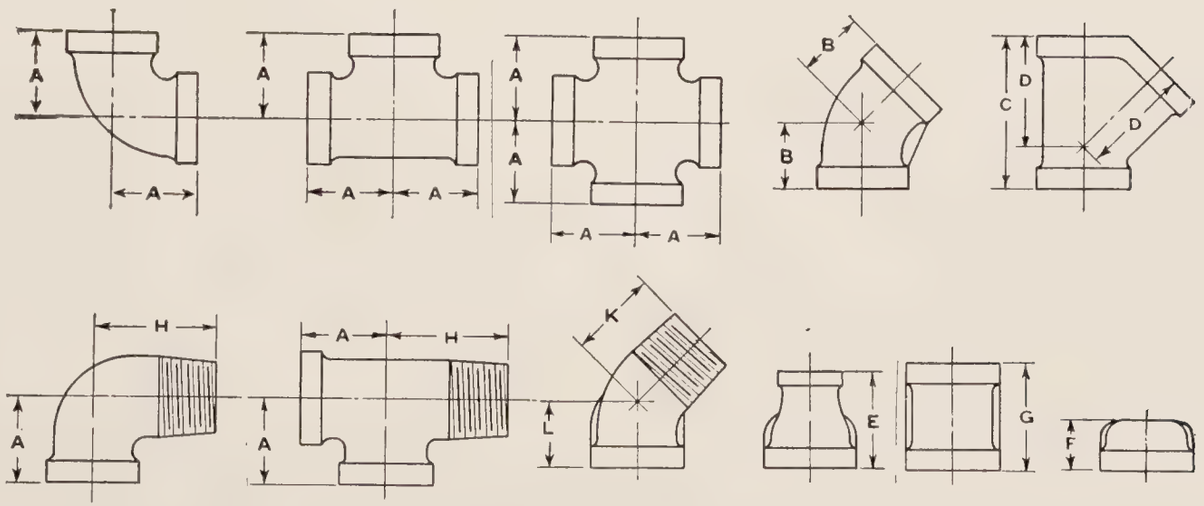


Size														
Size	Inches	1/8	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4
Size	Millimeters	3	6	10	13	19	25	32	38	50	64	76	90	100
A	Inches	9/16	11/16	3/4	15/16	1 1/8	1 5/16	1 9/16	1 3/4	2 3/16	2 9/16	3 1/16	3 7/16	3 3/4
B	Inches	1/2	9/16	5/8	11/16	13/16	15/16	1 1/8	1 1/4	1 7/16	1 11/16	2	2 3/8	2 1/2
C	Inches					2 7/8	3 7/16	4 1/16	4 1/2	5 7/16	6 1/4			
D	Inches					2	2 7/16	2 15/16	3 5/16	4 1/16	4 11/16			
E*	Inches		15/16	1 1/16	1 1/8	1 5/16	1 1/2	1 11/16	1 7/8	2 3/16	3 1/4	3 11/16		
F	Inches	7/16	9/16	5/8	11/16	3/4	7/8	1	1 1/8	1 5/16	1 1/2	1 3/4	1 7/8	2
G	Inches	7/8	15/16	1 1/16	1 1/8	1 5/16	1 1/2	1 11/16	1 7/8	2 3/16	2 9/16	3	3 1/8	3 3/8
H	Inches	1	1 1/8	1 1/4	1 7/16	1 5/8	1 7/8	2 3/16	2 7/16	2 7/8				

*For a reduction of one size only.
The above dimensions are subject to a slight variation and change without notice.

STANDARD MALLEABLE IRON SCREWED FITTINGS

GENERAL DIMENSIONS

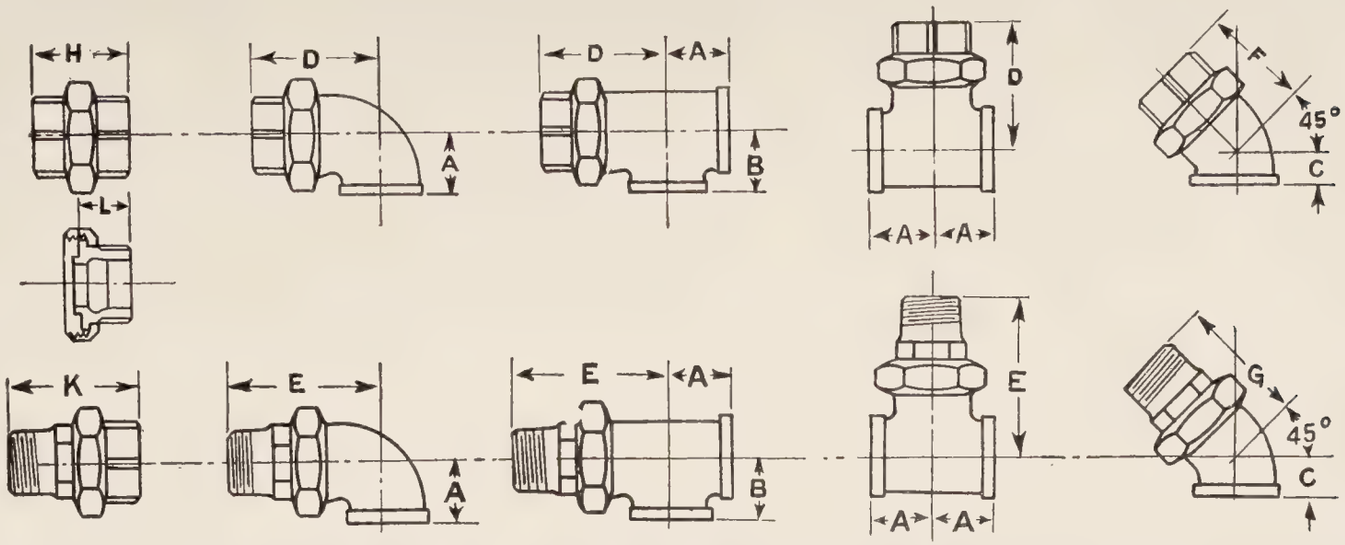


Size.....Inches	1/8	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5	6
Size.....Millimeters	3	6	10	13	19	25	32	38	50	64	76	90	100	113	125	150
A.....Inches	11/16	13/16	15/16	1 1/8	1 5/16	1 7/16	1 3/4	1 15/16	2 1/4	2 11/16	3 1/8	3 7/16	3 3/4	4 1/16	4 7/16	5 1/8
B.....Inches		3/4	13/16	7/8	1	1 1/8	1 5/16	1 7/16	1 11/16	1 15/16	2 3/16	2 3/8	2 5/8	2 13/16	3 1/16	3 7/16
C.....Inches			2 1/8	2 1/2	2 7/8	3 7/16	4 1/16	4 1/2	5 7/16	6 1/4	7 1/4		8 7/8			
D.....Inches			1 7/16	1 11/16	2	2 7/16	2 15/16	3 5/16	4 1/16	4 11/16	5 9/16		6 15/16			
E.....Inches		1	1 1/8	1 1/4	1 7/16	1 11/16	2 1/16	2 5/16	2 13/16	3 1/4	3 11/16	4	4 3/8			
F.....Inches	17/32	5/8	3/4	7/8	1 1/16	1 3/16	1 1/4	1 5/16	1 7/16	1 5/8	1 3/4	1 15/16	2		2 5/16	2 9/16
G.....Inches		1 1/16	1 3/16	1 5/16	1 1/2	1 11/16	1 15/16	2 1/8	2 1/2	2 7/8	3 3/16					
H.....Inches	1 1/8	1 5/16	1 7/16	1 5/8	1 7/8	2 1/8	2 1/2	2 11/16	3 3/16	3 13/16	4 1/2		5 11/16			
K.....Inches		15/16	1 1/16	1 3/16	1 5/16	1 1/2	1 11/16	1 7/8	2 1/4		3		3 3/4			
L.....Inches		5/8	11/16	13/16	15/16	1 1/16	1 1/4	1 3/8	1 11/16		2 1/8		2 1/2			

The above dimensions are subject to a slight variation and change without notice.

MALLEABLE IRON UNIONS, UNION ELBOWS AND UNION TEES

GENERAL DIMENSIONS

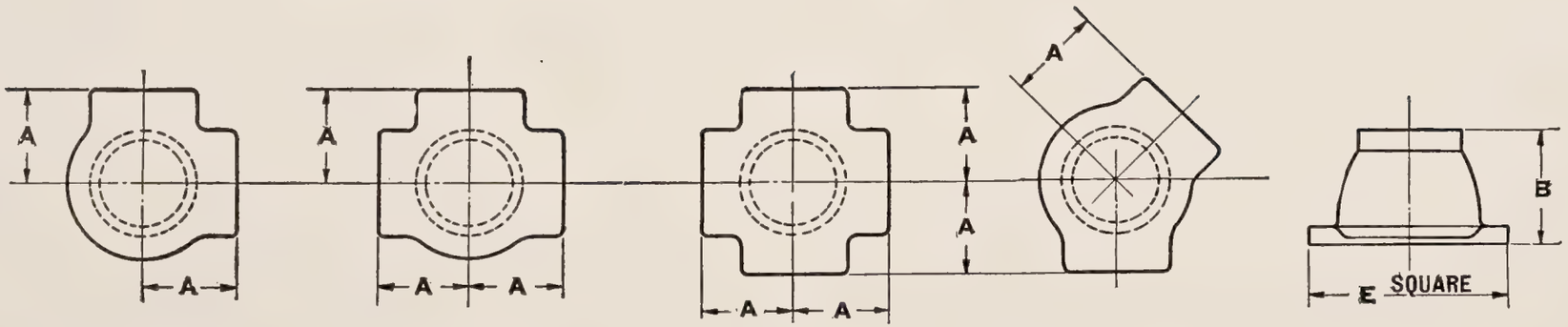


Size	Inches	1/8	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	1x 3/8	1x 1/2	1x 3/4
Size	Millimeters	3	6	10	13	19	25	32	38	50	64	76	90	100	25x10	25x13	25x19
A—Center to End, Ell and Tee	Std. & R. R.		13/16	15/16	1 1/8	1 5/16	1 7/16	1 3/4	1 15/16	2 1/4	2 11/16	3 1/8			1 3/16	1 1/4	1 5/16
B—Center to Outlet, Tee	Std. & R. R.		13/16	15/16	1 1/8	1 5/16	1 7/16	1 3/4	1 15/16	2 1/4	2 11/16	3 1/8			1 5/16	1 5/16	1 3/8
C—Center to End, 45° Ell	R. R.		3/4	13/16	7/8	1	1 1/8	1 5/16	1 7/16	1 11/16							
D—Center to End, Ell and Tee	Std.		1 13/16	2 1/16	2 5/16	2 5/8	3	3 7/16	3 13/16	4 3/8	4 7/8	5 5/8			2 5/8	2 11/16	2 13/16
	R. R.		1 13/16	2 1/16	2 5/16	2 5/8	3	3 7/16	3 13/16	4 3/8	5 1/8	5 15/16					
E—Center to End, Ell and Tee	Std.		2 7/16	2 3/4	3 1/16	3 1/2	3 15/16	4 7/16	4 3/4	5 3/8	6	6 15/16			3 9/16	3 5/8	3 3/4
	R. R.		2 7/16	2 3/4	3 1/16	3 1/2	3 15/16	4 7/16	4 3/4	5 3/8	6 1/8	7 1/16					
F—Center to End, 45° Ell	R. R.		1 9/16	1 11/16	1 7/8	2 1/8	2 7/16	2 3/4	3 1/16	3 1/2							
G—Center to End, 45° Ell	R. R.		2 3/16	2 3/8	2 11/16	3	3 3/8	3 3/4	4	4 1/2							
H—End to End	Std.	1 1/2	1 5/8	1 3/4	1 7/8	2 1/8	2 3/8	2 5/8	2 15/16	3 1/4	3 9/16	3 15/16	4 5/16	4 5/8			
	R. R. & Chi...	1 1/2	1 5/8	1 3/4	1 7/8	2 1/8	2 3/8	2 5/8	2 15/16	3 1/4	3 7/8	4 1/2	4 5/16	4 5/8			
	Navy & All Iron		1 11/16	1 13/16	1 15/16	2 3/16	2 7/16	2 3/4	3	3 7/16	3 7/8	4 1/2					
K—End to End	Std.		2 1/4	2 7/16	2 11/16	3 1/16	3 5/16	3 11/16	4	4 5/16	4 11/16	5 5/16					
	R. R.		2 1/4	2 7/16	2 11/16	3 1/16	3 5/16	3 11/16	4	4 5/16	4 7/8	5 5/8					
L—Std.	Two-Third		3/4	13/16	7/8	15/16	1 1/16	1 3/16	1 5/16	1 1/2	1 5/8	1 13/16	2	2 1/4			

The above dimensions are subject to a slight variation and change without notice.

BALL PATTERN RAILING FITTINGS

GENERAL DIMENSIONS

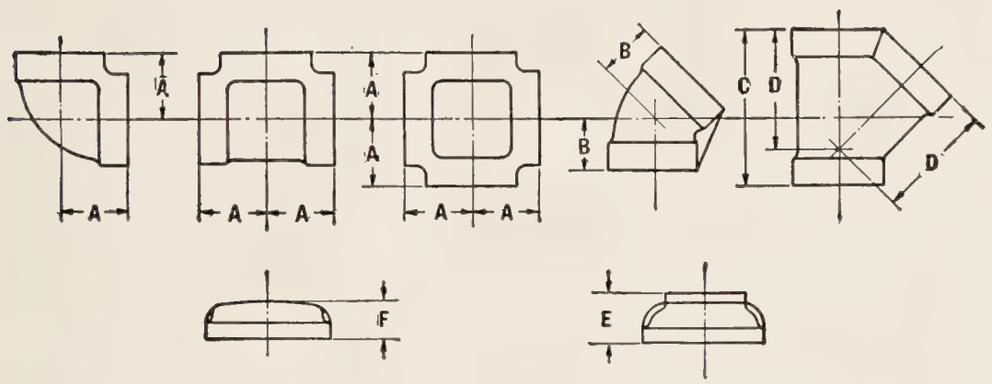


Nos. 1 and 2 | Nos. 3 and 4 | Nos. 5 and 6 | Nos. 11 and 12 | No. 7

Size....Inches	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4
Size....Millimeters	13	19	25	32	38	50	64	76	100
A....Inches	1 1/8	1 5/16	1 7/16	1 3/4	1 15/16	2 1/4	2 11/16	3 1/8	3 15/16
B....Inches	1 3/16	1 1/2	1 3/4	2 3/16	2 1/2	2 15/16	3 7/16	3 7/8	4 5/16
E....Inches	2 3/16	2 1/2	3 9/32	4 5/32	4 3/4	5 3/4	6 15/16	8 1/4	10 1/16

The above dimensions are subject to a slight variation and change without notice.

GENERAL DIMENSIONS OF STANDARD CAST IRON SCREWED FITTINGS



CAP

REDUCERS
REGULAR AND ECCENTRIC

Size Inches	Size Millimeters	Dimensions A Inches	Dimensions B Inches	Dimensions C Inches	Dimensions D Inches	Dimensions E Inches	Dimensions F Inches
1/4	6	13/16	3/4				
3/8	10	15/16	13/16				
1/2	13	1 1/8	7/8	2 1/2	1 7/8		
3/4	19	1 5/16	1	3	2 1/4		
1	25	1 7/16	1 1/8	3 1/2	2 3/4		
1 1/4	32	1 3/4	1 5/16	4 1/4	3 1/4	2 1/8	
1 1/2	38	1 15/16	1 7/16	4 7/8	3 13/16	2 1/4	
2	50	2 1/4	1 11/16	5 3/4	4 1/2	2 7/16	
2 1/2	64	2 11/16	1 15/16	6 3/4	5 3/16	2 11/16	
3	76	3 1/8	2 3/16	7 7/8	6 1/8	2 15/16	
3 1/2	90	3 7/16	2 3/8	8 7/8	6 7/8	3 1/8	
4	100	3 3/4	2 5/8	9 3/4	7 5/8	3 3/8	2 1/16
4 1/2	113	4 1/16	2 13/16	10 5/8	8 1/2	3 5/8	2 3/16
5	125	4 7/16	3 1/16	11 5/8	9 1/4	3 7/8	2 3/8
6	150	5 1/8	3 7/16	13 7/16	10 3/4	4 3/8	2 5/8
7	175	5 13/16	3 7/8	15 1/4	12 1/4	4 13/16	2 7/8
8	200	6 1/2	4 1/4	16 15/16	13 5/8	5 1/4	3 1/8
9	225	7 3/16	4 11/16	20 11/16	16 3/4	5 11/16	3 3/8
10	250	7 7/8	5 3/16	20 11/16	16 3/4	6 3/16	3 5/8
12	300	9 1/4	6	24 1/8	19 5/8	7 1/8	4 1/4

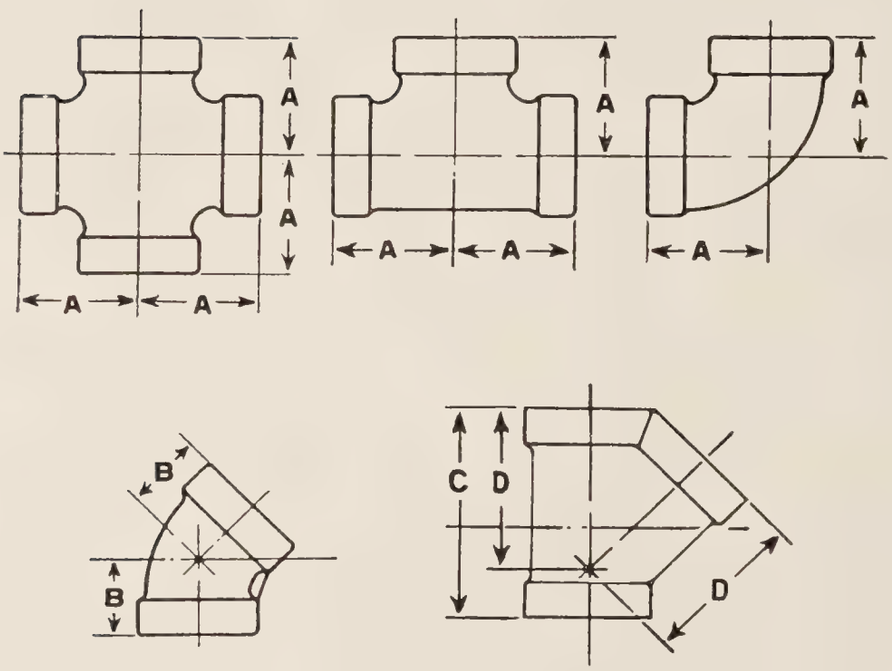
The above dimensions are subject to a slight variation and change without notice.

EXTRA HEAVY

CAST IRON

SCREWED FITTINGS

GENERAL DIMENSIONS



Size.....Inches	1	1¼	1½	2	2½	3	3½	4
Size.....Millimeters	25	32	38	50	64	76	90	100
Dimensions A.....Inches	2	2¼	2 9/16	3	3½	4⅛	4 11/16	5⅛
Dimensions B.....Inches	⅜	½	⅝	1 15/16	2¼	2½	2 9/16	2¾
Dimensions C.....Inches		4⅞	5¾	6¾	7⅞	8⅞		10⅝
Dimensions D.....Inches		3 13/16	4½	5 3/16	6⅛	6⅞		8½

Size.....Inches	4½	5	6	7	8	10	12	
Size.....Millimeters	113	125	150	175	200	250	300	
Dimensions A.....Inches	5½	6⅛	7¼	8⅛	9⅛	11⅜	13⅜	
Dimensions B.....Inches	3	3 5/16	3¾	4	4¾	4⅞	5½	
Dimensions C.....Inches			15¼	16 15/16	18⅛			
Dimensions D.....Inches			12¼	13⅝	14			

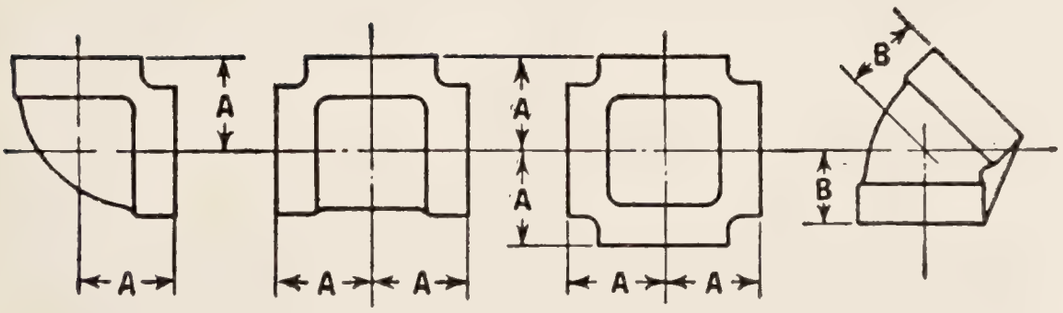
The above dimensions are subject to a slight variation and change without notice.

EXTRA HEAVY MALLEABLE IRON

SCREWED FITTINGS

MARKING, C X M

GENERAL DIMENSIONS



Size.....Inches	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2
Size.....Millimeters	6	9	13	19	25	32	38	50
Dimensions A.....Inches	13/16	15/16	1 1/8	1 5/16	1 7/16	1 3/4	1 15/16	2 1/4
Dimensions B.....Inches	3/4	13/16	7/8	1	1 1/8	1 5/16	1 7/16	1 11/16

Size.....Inches	2 1/2	3	3 1/2	4	4 1/2	5	6	
Size.....Millimeters	64	76	90	100	113	125	150	
Dimensions A.....Inches	2 11/16	3 1/8	3 7/16	3 3/4	4 1/16	4 7/16	5 1/8	
Dimensions B.....Inches	1 15/16	2 3/16	2 3/8	2 5/8	2 13/16	3 1/16	3 7/16	

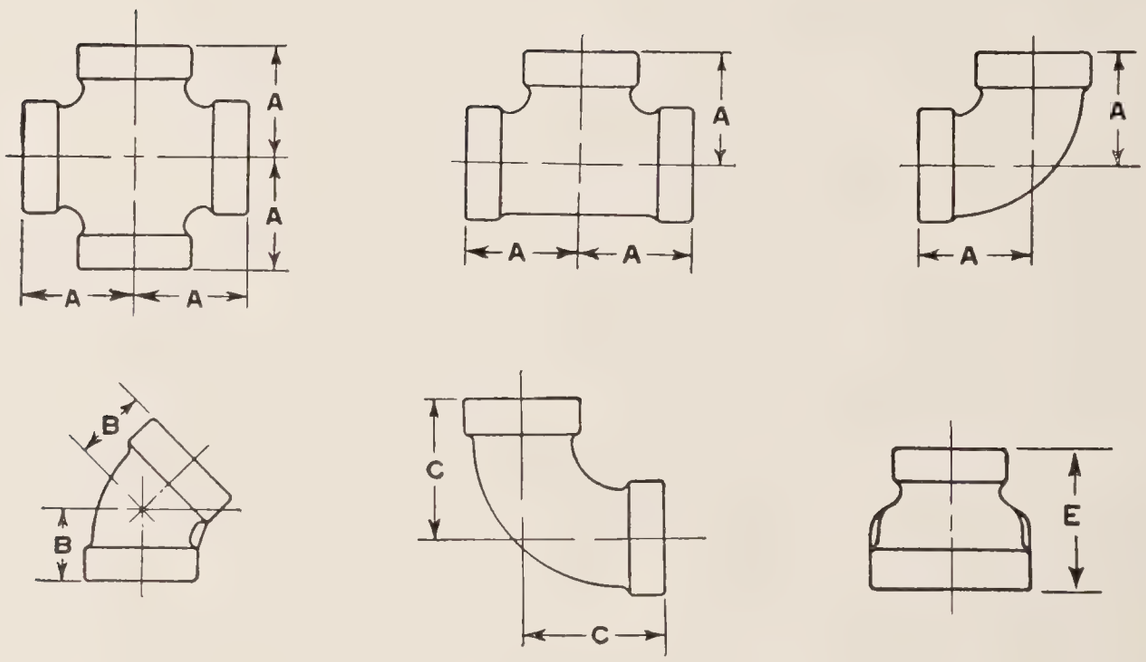
The above dimensions are subject to a slight variation and change without notice.

HYDRAULIC

MALLEABLE IRON

SCREWED FITTINGS

GENERAL DIMENSIONS



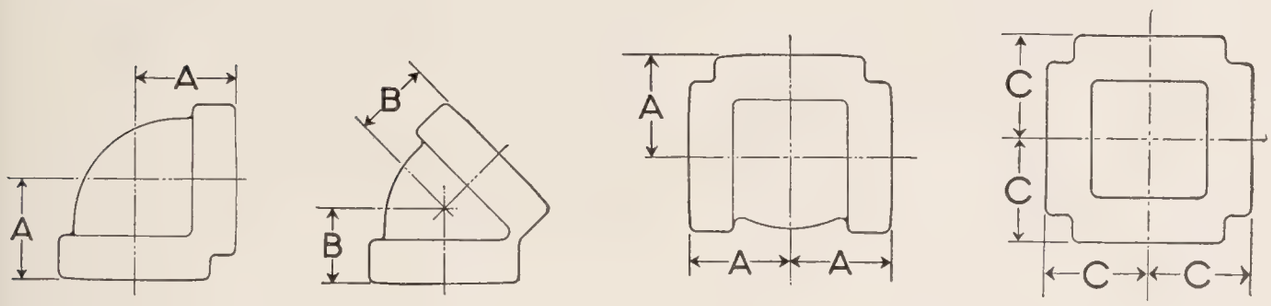
Size.....Inches	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2
Size.....Millimeters	6	10	13	19	25	32	38
Dimensions A.....Inches	1 1/16	1 1/4	1 1/2	1 3/4	2	2 1/4	2 1/2
Dimensions B.....Inches	3/4	7/8	1	1 1/8	1 5/16	1 1/2	1 11/16
Dimensions C.....Inches					2 1/2	3	3 1/2
Dimensions E.....Inches		1 7/16	1 11/16	1 3/4	2	2 3/8	2 11/16

Size.....Inches	2	2 1/2	3	3 1/2	4	5	6
Size.....Millimeters	50	64	76	90	100	125	150
Dimensions A.....Inches	3	3 1/2	4 1/8	4 5/8	5 1/8	6 1/4	7 1/4
Dimensions B.....Inches	2	2 1/4	2 1/2	2 5/8	2 13/16	3 3/16	3 1/2
Dimensions C.....Inches	4	4 3/4	5 1/2	6 1/4	7	8 1/2	9 1/2
Dimensions E.....Inches	3 3/16	3 11/16	4 1/16				

The above dimensions are subject to a slight variation and change without notice.

FORGED STEEL SCREWED FITTINGS

GENERAL DIMENSIONS



FOR COLD WATER OR OIL WORKING PRESSURES UP TO 3000 POUNDS PER SQUARE INCH HYDROSTATIC

No. 300 D, Elbows.
No. 301 D, Reducing Elbows.
No. 302 D, 45 Degree Elbows.
No. 304 D, Tees.
No. 306 D, Reducing Tees.
No. 307 D, Crosses.

Size.....Inches	¼	⅜	½	¾	1	1¼	1½	2	2½
Size.....Millimeters	6	9	13	19	25	32	38	50	64
A—Center to End, Elbows and Tees...Inches	15/16	15/16	1 1/8	1 5/16	1 7/16	1 3/4	1 15/16	2 1/4	2 11/16
B—Center to End, 45° Elbows. Ins.	7/8	7/8	7/8	1 3/16	1 3/16	1 7/16	1 7/16	1 11/16	2 1/16
C—Center to End Cross....Inches		1 5/16	1 5/16	1 5/16	1 15/16	1 15/16	1 15/16	2 11/16	2 11/16

FOR COLD WATER OR OIL WORKING PRESSURES UP TO 6000 POUNDS PER SQUARE INCH HYDROSTATIC

No. 310 D, Elbows.
No. 311 D, Reducing Elbows.
No. 312 D, 45 Degree Elbows.
No. 314 D, Tees.
No. 316 D, Reducing Tees.
No. 317 D, Crosses.

Size.....Inches	¼	⅜	½	¾	1	1¼	1½	2
Size.....Millimeters	6	9	13	19	25	32	38	50
A—Center to End, Elbows and Tees. Ins.	15/16	1 1/8	1 1/8	1 7/16	1 3/4	1 15/16	2 1/4	2 11/16
B—Center to End, 45° Elbows..Inches.	7/8	7/8	1 3/16	1 3/16	1 7/16	1 7/16	1 11/16	2 1/16
C—Center to End, Crosses.....Inches	1 5/16	1 5/16	1 5/16	1 15/16	1 15/16	1 15/16	2 11/16	2 11/16

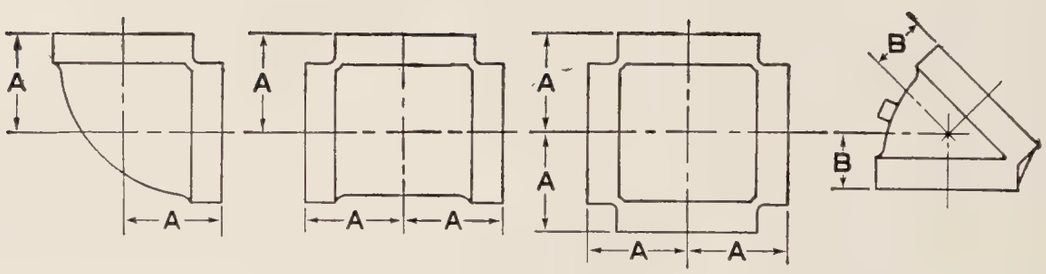
REDUCING FITTINGS

Reducing Fittings have the same center to face dimensions as straight size fittings.

CAST STEEL SCREWED FITTINGS

GENERAL DIMENSIONS

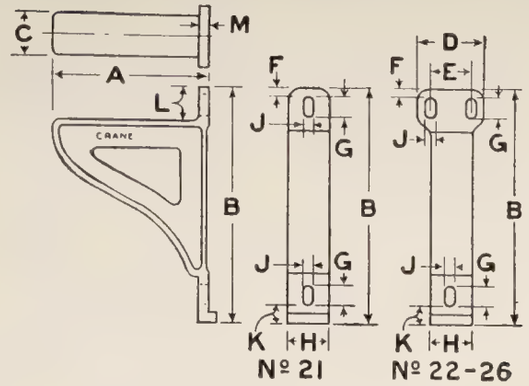
SERIES 25-80 AND 40-200



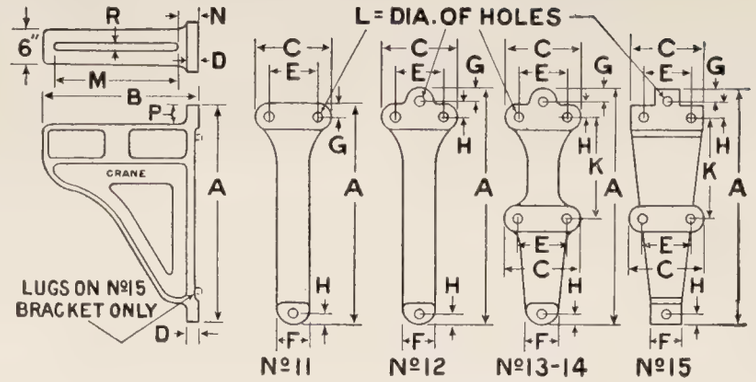
ELBOW	TEE	CROSS	45° ELBOW
No. 260D No. 760D	No. 264D No. 764D	No. 266D No. 766D	No. 262D No. 762D

Size.....Inches	2½	3	3½	4	4½
Size.....Millimeters	64	76	90	100	113
A—Center to End.....Inches	3¼	3¾	4⅛	4½	5
B—Center to End, 45° Elbows.....Inches	2¼	2½	2⅝	2 13/16	2 15/16
Size.....Inches	5	6	8	10	12
Size.....Millimeters	125	150	200	250	300
A—Center to End.....Inches	5½	6¼	7¾	9¼	11½
B—Center to End, 45° Elbows.....Inches	3 3/16	3½	4 5/16	5 3/16	6

GENERAL DIMENSIONS OF WALL BRACKETS



STANDARD PATTERN



HEAVY PATTERN

STANDARD PATTERN

Number of Bracket	A	B	C	D	E	F	G	H	J	K	L	M
21	15	23	4			15/16	2 1/8	4	1 1/8	1 9/16	3 3/4	1
22	18	26 5/16	6	7 1/8	4	1	2 1/8	4 1/2	1 1/8	1 11/16	3 13/16	1
23	20	29 5/16	6	7 3/4	4 5/8	1	2 1/8	5	1 1/8	1 11/16	3 7/8	1 1/8
24	23	32 7/8	6	8 1/2	5 1/4	1 1/16	2 1/8	5 1/2	1 1/8	2 1/16	4	1 1/4
25	25	37	6	9 1/8	5 7/8	1 1/16	2 1/8	6	1 1/8	2 5/16	4	1 3/8
26	28	40	6	10	6 1/2	1 3/16	2 1/8	6	1 1/8	2 3/16	4	1 1/2

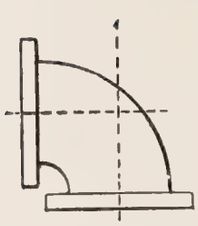
HEAVY PATTERN

Number of Bracket	A	B	C	D	E	F	G	H	K	L	M	N	P	R
11	34	25	12	1 1/8	8	6	2			1 1/4	20 1/2	2 1/4	3	1 1/4
12	40	30	14	1 1/2	10	6	2	2 3/4		1 1/8	24 1/2	2 7/8	3 1/2	1 3/8
13	45	34	16	1 3/8	12	8	2	2 3/4	17 3/4	1 1/8	28 1/4	3 3/8	3 1/2	1 1/2
14	51 1/2	40	19	1 5/8	15	10	2	2 1/2	25 3/4	1 1/8	33	4 1/2	3 1/2	1 5/8
15	64	44 1/8	19	1 5/8	15	10	2	2 3/4	27 1/4	1 1/4	34 3/4	4 3/4	4	1 5/8

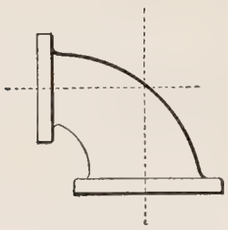
Note.—The above dimensions subject to a slight variation and change without notice.

AMERICAN STANDARD

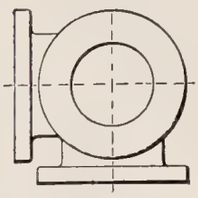
NAMES OF FLANGED FITTINGS



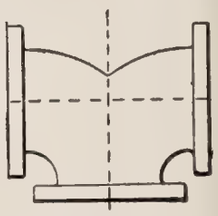
ELBOW



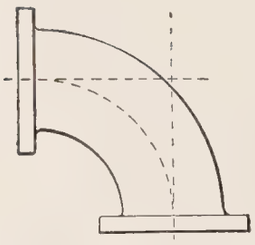
REDUCING ELBOW



SIDE OUTLET ELBOW

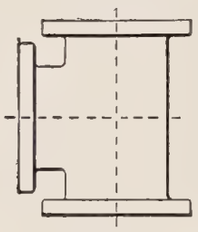


DOUBLE BRANCH ELBOW

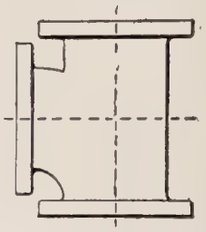


LONG RADIUS ELBOW

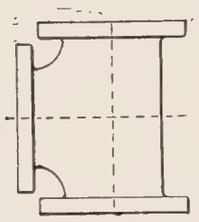
45° ELBOW



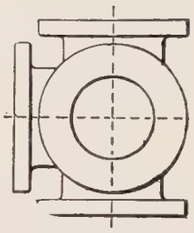
TEE



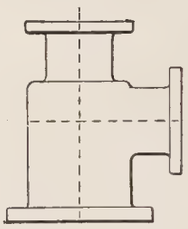
SINGLE SWEEP TEE



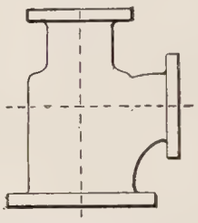
DOUBLE SWEEP TEE



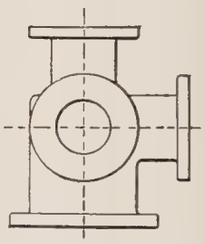
SIDE OUTLET TEE



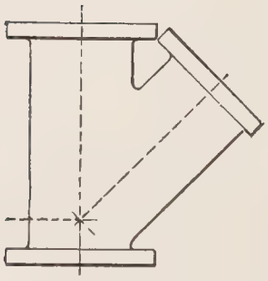
REDUCING TEE



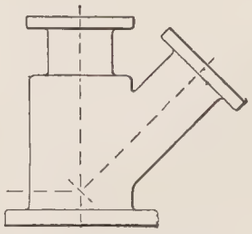
REDUCING SINGLE SWEEP TEE



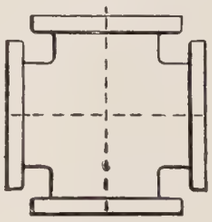
REDUCING SIDE OUTLET TEE



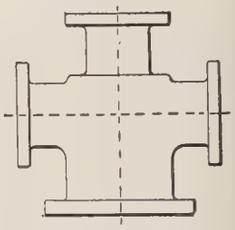
LATERAL



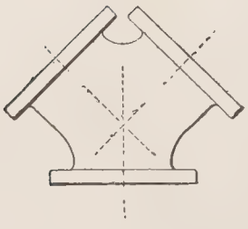
REDUCING LATERAL



CROSS



REDUCING CROSS



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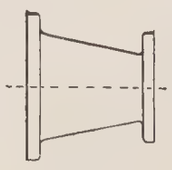
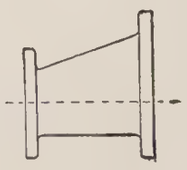


REDUCER

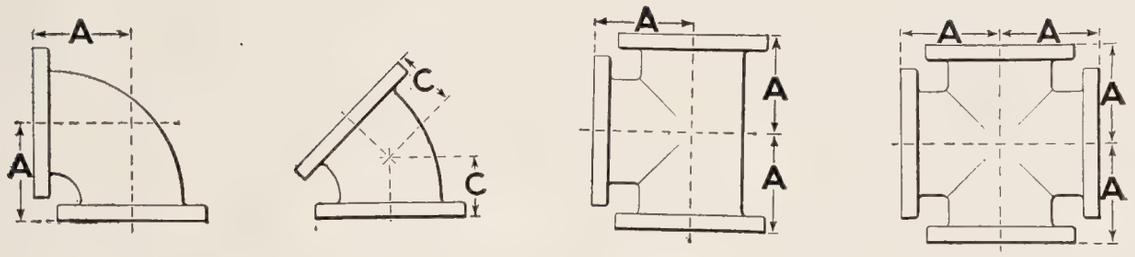


ECCENTRIC REDUCER

STANDARD AND EXTRA HEAVY

BRASS FLANGED FITTINGS

GENERAL DIMENSIONS



STANDARD FLANGED FITTINGS

Size.....Inches	2	2½	3	3½	4	4½	5	6
Size.....Millimeters	50	64	76	90	100	113	125	150
A-A—Face to Face.....Inches	9	10	11	12	13	14	15	16
A—Center to Face.....Inches	4½	5	5½	6	6½	7	7½	8
C—Center to Face of 45° Elbows. Inches	2½	3	3	3½	4	4	4½	5
Diameter of Flanges.....Inches	6	7	7½	8½	9	9¼	10	11
Thickness of Flanges.....Inches	½	9/16	5/8	11/16	11/16	23/32	¾	13/16

EXTRA HEAVY FLANGED FITTINGS

Size.....Inches	1	1¼	1½	2	2½	3	3½	4	4½	5	6
Size.....Millimeters	25	32	38	50	64	76	90	100	113	125	150
A-A—Face to Face..Ins.	8	8½	9	10	11	12	13	14	15	16	17
A—Center to Face...Ins.	4	4¼	4½	5	5½	6	6½	7	7½	8	8½
C—Center to Face of 45° Elbows. Ins.	2	2½	2¾	3	3½	3½	4	4½	4½	5	5½
Diameter of Flanges.....Inches	4½	5	6	6½	7½	8¼	9	10	10½	11	12½
Thickness of Flanges.....Inches	½	17/32	9/16	5/8	11/16	¾	13/16	⅞	⅞	15/16	1

Flanged Fittings are drilled in multiples of four, so that they may be made to face in any quarter and bolt holes straddle center line.

Unless otherwise specified, we will always furnish our Brass Flanged Fittings and Companion Flanges with plain face, scored with shallow "V" Grooves inside of bolt holes.

When coupled with Extra Heavy Iron Flanges, Valves or Fittings, the iron fittings or valves should be ordered without the raised face.

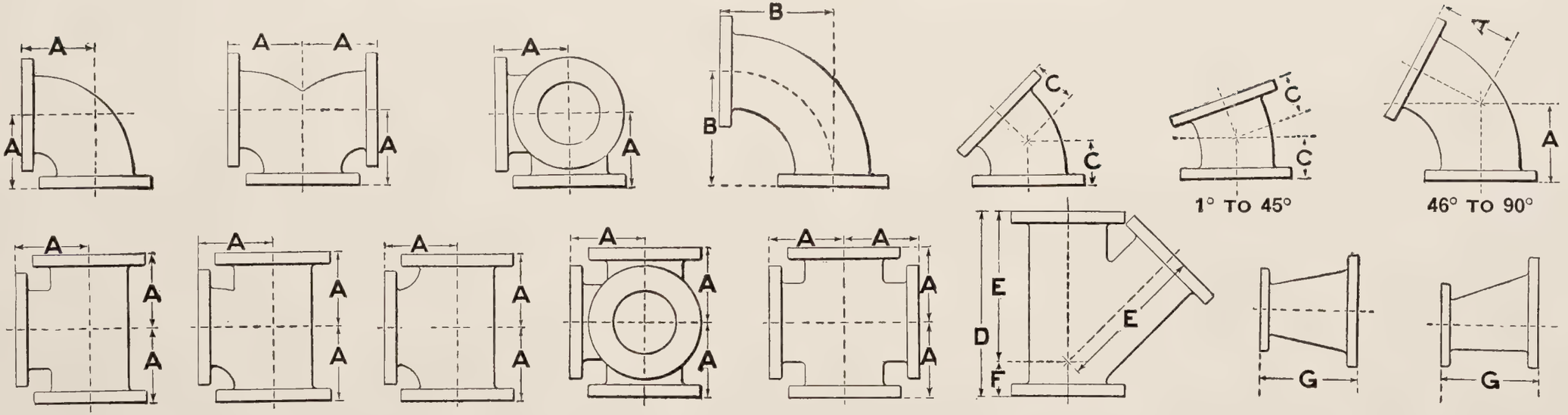
TEMPLATES FOR DRILLING SEE PAGE 595

AMERICAN STANDARD

STANDARD AND LOW PRESSURE FLANGED FITTINGS

CAST IRON

GENERAL DIMENSIONS OF STRAIGHT SIZES



Size.....Inches	1	1¼	1½	2	2½	3	3½	4	4½	5	6	7	8	9	10	12	14	15	16	18	20
Size.....Millimeters	25	32	38	50	64	76	90	100	113	125	150	175	200	225	250	300	350	375	400	450	500
AA—Face to Face, Tees and Crosses.Inches	7	7½	8	9	10	11	12	13	14	15	16	17	18	20	22	24	28	29	30	33	36
*A—C.to F.,Elbows, Tees and CrossesInches	3½	3¾	4	4½	5	5½	6	6½	7	7½	8	8½	9	10	11	12	14	14½	15	16½	18
B—C. to F., Long Radius Elbows....Inches	5	5½	6	6½	7	7¾	8½	9	9½	10¼	11½	12¾	14	15¼	16½	19	21½	22¾	24	26½	29
*C—Center to Face, 45° Elbows ....Inches	1¾	2	2¼	2½	3	3	3½	4	4	4½	5	5½	5½	6	6½	7½	7½	8	8	8½	9½
D—Face to Face, 45° Laterals.....Inches	7½	8	9	10½	12	13	14½	15	15½	17	18	20½	22	24	25½	30	33	34½	36½	39	43
E—Center to Face, 45° Laterals.....Inches	5¾	6¼	7	8	9½	10	11½	12	12½	13½	14½	16½	17½	19½	20½	24½	27	28½	30	32	35
F—Center to Face, 45° Laterals.....Inches	1¾	1¾	2	2½	2½	3	3	3	3	3½	3½	4	4½	4½	5	5½	6	6	6½	7	8
G—Face to Face, Reducers.....Inches						6	6½	7	7½	8	9	10	11	11½	12	14	16	17	18	19	20
Diameter of Flanges.....Inches	4	4½	5	6	7	7½	8½	9	9¼	10	11	12½	13½	15	16	19	21	22¼	23½	25	27½
Thickness of Flanges.....Inches	7/16	1/2	9/16	5/8	11/16	3/4	13/16	15/16	15/16	15/16	1	1 1/16	1 1/8	1 1/8	1 3/16	1 1/4	1 3/8	1 3/8	1 7/16	1 9/16	1 11/16

*Special Angle Fittings 1° to 45° use center to face dimension of 45° Elbow, and 46° to 90° use center to face dimension of 90° Elbow.

STANDARD AND LOW PRESSURE FLANGED FITTINGS

CAST IRON

GENERAL DIMENSIONS OF STRAIGHT SIZES

CONTINUED

Size.....In.	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52	54	56	58	60	62
Size.....Millimeters	550	600	650	700	750	800	850	900	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550
AA—Face to Face, Tees and Crosses..In.	40	44	46	48	50	52	54	56	58	60	62	64	66	68	70	74	78	82	84	88	90
*A—C. to F., Elbows, Tees and Crosses. In.	20	22	23	24	25	26	27	28	29	30	31	32	33	34	35	37	39	41	42	44	45
B—C. to F., Long Radius Elbows.....In.	31½	34	36½	39	41½	44	46½	49	51½	54	56½	59	61½	64	66½	69	71½	74	76½	79	81½
*C—Center to Face, 45° Elbows .....In.	10	11	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
D—F. to F., 45° Laterals...In.	46	49½	53	56	59																
E—C. to F., 45° Laterals...In.	37½	40½	44	46½	49																
F—C. to F., 45° Laterals...In.	8½	9	9	9½	10																
G—Face to Face, Reducers. In.	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52	54	56	58	60	62
Diameter of Flanges.....In.	29½	32	34¼	36½	38¾	41¾	43¾	46	48¾	50¾	53	55¼	57¼	59½	61¾	64	66¼	68¾	71	73	75¾
Thickness of Flanges.....In.	1 13/16	1 7/8	2	2 1/16	2 1/8	2 1/4	2 5/16	2 3/8	2 3/8	2 1/2	2 5/8	2 5/8	2 11/16	2 3/4	2 3/4	2 7/8	3	3	3 1/8	3 1/8	3 1/4
Size.....In.	64	66	68	70	72	74	76	78	80	82	84	86	88	90	92	94	96	98	100		
Size.....Millimeters	1600	1650	1700	1750	1800	1850	1900	1950	2000	2050	2100	2150	2200	2250	2300	2350	2400	2450	2500		
AA—Face to Face, Tees and Crosses..In.	94	96	100	102	106	108	112	116	118	120	124	126	130	134	136	138	142	146	148		
*A—C. to F., Elbows, Tees and Crosses. In.	47	48	50	51	53	54	56	58	59	60	62	63	65	67	68	69	71	73	74		
B—C. to F., Long Radius Elbows.....In.	84	86½	89	91½	94	96½	99	101¼	104	106½	109	111½	114	116½	119	121½	124	126½	129		
*C—Center to Face, 45° Elbows .....In.	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50		
G—Face to Face, Reducers. In.	64	66	68	70	72	74	76	78	80	82	84	86	88	90	92	94	96	98	100		
Diameter of Flanges.....In.	78	80	82¼	84½	86½	88½	90¾	93	95¼	97½	99¾	102	104¼	106½	108¾	111	113¼	115½	117¾		
Thickness of Flanges.....In.	3¼	3 3/8	3 3/8	3½	3½	3 5/8	3 5/8	3¾	3¾	3 7/8	3 7/8	4	4	4 1/8	4 1/8	4¼	4¼	4 3/8	4 3/8		

*Special Angle Fittings 1° to 45° use center to face dimension of 45° Elbow, and 46° to 90° use center to face dimension of 90° Elbow.

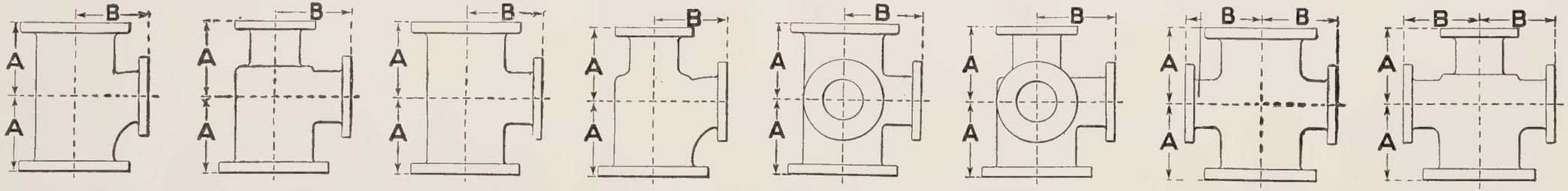
Standard and Low Pressure Flanged Fittings are furnished plain faced unless otherwise ordered.

AMERICAN STANDARD

STANDARD AND LOW PRESSURE FLANGED FITTINGS

CAST IRON

GENERAL DIMENSIONS OF REDUCING TEES AND CROSSES



SHORT BODY PATTERN

Size.....Inches	1	1¼	1½	2	2½	3	3½	4	4½	5	6	7	8	9	10	12	14	15	16	18	20	22	24	26	28	30	32	34	36	38	40
Size.....Millimeters	25	32	38	50	64	76	90	100	113	125	150	175	200	225	250	300	350	375	400	450	500	550	600	650	700	750	800	850	900	950	1000
*Size Out. & Smlr Ins.	All reducing fittings 1-inch to 16-inch, inclusive, have the same center to face dimensions as straight size fittings.																			12	14	15	16	18	18	20	20	22	24	24	26
Size Out. & Sm. Millm.																				300	350	375	400	450	450	500	500	550	600	600	650
AA—F. to F., Run Ins.																				26	28	28	30	32	32	36	36	38	40	40	44
A—C. to F., Run Ins.																				13	14	14	15	16	16	18	18	19	20	20	22
B—C. to F., Outlet Ins.																				15½	17	18	19	20	21	23	24	25	26	28	29

Size. .....Inches	42	44	46	48	50	52	54	56	58	60	62	64	66	68	70	72	74	76	78	80	82	84	86	88	90	92	94	96	98	100
Size...Millimeters	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650	1700	1750	1800	1850	1900	1950	2000	2050	2100	2150	2200	2250	2300	2350	2400	2450	2500
Size of Out. & Sm. In.	28	28	30	32	32	34	36	36	38	40	40	42	44	44	46	48	48	50	52	52	54	56	56	58	60	60	62	64	64	66
Size of O. & S. Mill.	700	700	750	800	800	850	900	900	950	1000	1000	1050	1100	1100	1150	1200	1200	1250	1300	1300	1350	1400	1400	1450	1500	1500	1550	1600	1600	1650
AA-F. to F., Run. In.	46	46	48	52	52	54	58	58	62	66	66	68	70	70	74	80	80	84	86	86	88	94	94	96	100	100	104	106	106	110
A-C to F. Run. In.	23	23	24	26	26	27	29	29	31	33	33	34	35	35	37	40	40	42	43	43	44	47	47	48	50	50	52	53	53	55
B-C. to F, Out In.	30	31	33	34	35	36	37	39	40	41	42	44	45	46	47	48	49	50	52	53	54	56	57	58	61	62	63	64	65	67

***LONG BODY PATTERNS** Are used when outlets are larger than given in the above table, therefore have same dimensions as straight size fittings.

The dimensions of "Reducing Flanged Fittings" are always regulated by the reduction of the outlet.

FITTINGS REDUCING ON THE RUN ONLY, the long body pattern will always be used, **EXCEPT DOUBLE SWEEP TEES,** on which the reduced end is always longer than the regular fittings. Dimensions on request.

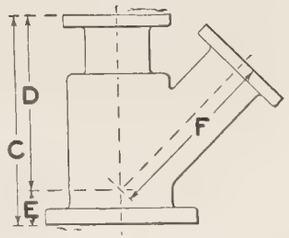
BULL HEADS OR TEES having outlets larger than the run, will be the same length center to face of all openings as a Tee with all openings of the size of the outlet. For example a 12 x 12 x 18-inch Tee will be governed by the dimensions of the 18-inch Long Body Tee, namely, 16½ inches center to face of all openings and 33 inches face to face.

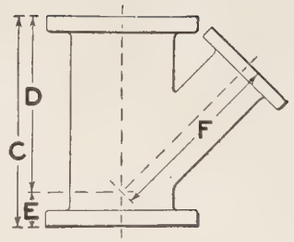
REDUCING ELBOWS carry same center to face dimension as regular elbows of largest straight size.

STANDARD AND LOW PRESSURE FLANGED FITTINGS

CAST IRON

GENERAL DIMENSIONS OF REDUCING 45° LATERALS





SHORT BODY PATTERN

Size.....Inches	1	1¼	1½	2	2½	3	3½	4	4½	5	6	7	8	9	10	12	14	15	16	18	20	22	24	26	28	30
Size.....Millimeters	25	32	38	50	64	76	90	100	113	125	150	175	200	225	250	300	350	375	400	450	500	550	600	650	700	750
*Size of Branch and Smaller.....Inches	All reducing fittings 1 to 16-inch, inclusive, have same center to face dimensions as straight size fittings.																			9	10	10	12	12	14	15
Size.....Millimeters																				225	250	250	300	300	350	375
C—Face to Face, Run.....Inches																				26	28	29	32	35	37	39
D—Center to Face, Run.....Inches																				25	27	28½	31½	35	37	39
E—Center to Face, Run.....Inches																				1	1	½	½	0	0	0
F—Center to Face, Branch.....Inches																				27½	29½	31½	34½	38	40	42

***LONG BODY PATTERNS** Are used when branches are larger than given in the above table, therefore have same dimensions as straight size fittings.

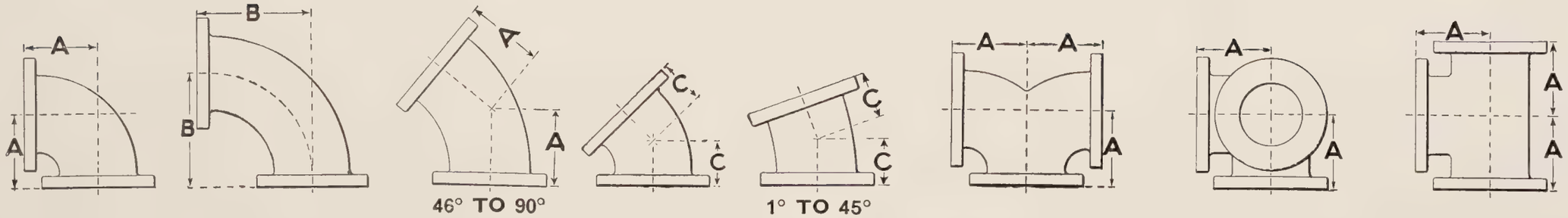
The dimensions of Reducing Flanged Fittings are always regulated by the reduction of the branch; fittings reducing on the run only, the long body pattern will always be used.

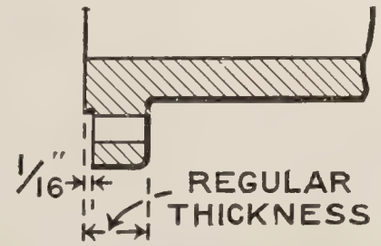
AMERICAN STANDARD

EXTRA HEAVY FLANGED FITTINGS

CAST IRON, FERROSTEEL AND CAST STEEL

GENERAL DIMENSIONS OF STRAIGHT SIZES





NOTE—All extra heavy flanges have a 1/16-inch Raised Face inside of bolt holes. This Raised Face is included in face to face, center to face and thickness of flange dimensions.

AMERICAN STANDARD

EXTRA HEAVY FLANGED FITTINGS

CAST IRON, FERROSTEEL AND CAST STEEL

GENERAL DIMENSIONS OF STRAIGHT SIZES

Size ..... In.	1	1¼	1½	2	2½	3	3½	4	4½	5	6	7	8	9	10	12	14	15
Size ..... Millimeters	25	32	38	50	64	76	90	100	113	125	150	175	200	225	250	300	350	375
AA–Face to Face, Tees and Crosses In.	8	8½	9	10	11	12	13	14	15	16	17	18	20	21	23	26	30	31
*A–Center to Face, Elbows, Tees and Crosses. In.	4	4¼	4½	5	5½	6	6½	7	7½	8	8½	9	10	10½	11½	13	15	15½
B–Center to Face, Long Radius Elbows ..... In.	5	5½	6	6½	7	7¾	8½	9	9½	10¼	11½	12¾	14	15¼	16½	19	21½	22¾
*C–Center to Face, 45° Elbows.... In.	2	2½	2¾	3	3½	3½	4	4½	4½	5	5½	6	6	6½	7	8	8½	9
D–Face to Face, 45° Laterals ..... In.	8½	9½	11	11½	13	14	15½	16½	18	18½	21½	23½	25½	27½	29½	33½	37½	39½
E–Center to Face, 45° Laterals ... In.	6½	7¼	8½	9	10½	11	12½	13½	14½	15	17½	19	20½	22½	24	27½	31	33
F–Center to Face, 45° Laterals .... In.	2	2¼	2½	2½	2½	3	3	3	3½	3½	4	4½	5	5	5½	6	6½	6½
G–Face to Face, Reducers ..... In.						6	6½	7	7½	8	9	10	11	11½	12	14	16	17
Diameter of Flanges ..... In.	4½	5	6	6½	7½	8¼	9	10	10½	11	12½	14	15	16¼	17½	20½	23	24½
Thickness of Flanges ..... In.	11/16	¾	13/16	⅞	1	1⅛	1 3/16	1¼	1 5/16	1⅜	1 7/16	1½	1 5/8	1¾	1⅞	2	2⅛	2 3/16
Size ..... In.	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	
Size ..... Millimeters	400	450	500	550	600	650	700	750	800	850	900	950	1000	1050	1100	1150	1200	
AA–Face to Face, Tees and Crosses In.	33	36	39	41	45	48	52	55	58	61	65	68	71	74	78	81	84	
*A–Center to Face, Elbows, Tees and Crosses. In.	16½	18	19½	20½	22½	24	26	27½	29	30½	32½	34	35½	37	39	40½	42	
B–Center to Face, Long Radius Elbows. ..... In.	24	26½	29	31½	34	36½	39	41½	44	46½	49	51½	54	56½	59	61½	64	
*C–Center to Face, 45° Elbows.... In.	9½	10	10½	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
D–Face to Face, 45° Laterals ..... In.	42	45½	49	53	57½													
E–Center to Face, 45° Laterals ... In.	34½	37½	40½	43½	47½													
F–Center to Face, 45° Laterals ... In.	7½	8	8½	9½	10													
G–Face to Face, Reducers ..... In.	18	19	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	
Diameter of Flanges ..... In.	25½	28	30½	33	36	38¼	40¾	43	45¼	47½	50	52¼	54½	57	59¼	61½	65	
Thickness of Flanges ..... In.	2¼	2⅜	2½	2⅝	2¾	2 13/16	2 15/16	3	3⅛	3¼	3⅜	3 7/16	3 9/16	3 11/16	3¾	3⅞	4	

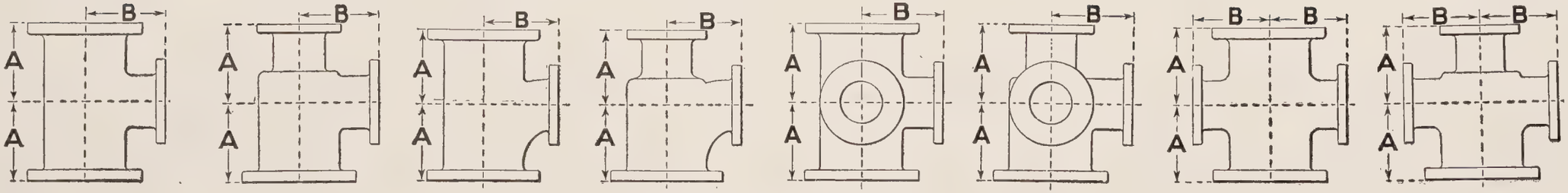
***SPECIAL ANGLE FITTINGS** 1° to 45° use center to face dimension of 45° Elbow, and 46° to 90° use center to face dimension of 90° Elbow.

AMERICAN STANDARD

EXTRA HEAVY FLANGED FITTINGS

CAST IRON, FERROSTEEL AND CAST STEEL

GENERAL DIMENSIONS REDUCING TEES AND CROSSES



SHORT BODY PATTERN

All reducing fittings 1-inch to 16-inch, inclusive, have the same center to face dimensions as straight size fittings.

Size.....Inches	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48
Size.....Millimeters	450	500	550	600	650	700	750	800	850	900	950	1000	1050	1100	1150	1200
*Size of Outlet and Smaller.....Inches	12	14	15	16	18	18	20	20	22	24	24	26	28	28	30	32
*Size of Outlet and Smaller.....Millimeters	300	350	375	400	450	450	500	500	550	600	600	650	700	700	750	800
AA—Face to Face, Run.....Inches	28	31	33	34	38	38	41	41	44	47	47	50	53	53	55	58
A—Center to Face, Run.....Inches	14	15½	16½	17	19	19	20½	20½	22	23½	23½	25	26½	26½	27½	29
B—Center to Face, Outlet.....Inches	17	18½	20	21½	23	24	25½	26½	28	29½	30½	31½	33½	34½	35½	37½

***LONG BODY PATTERNS** { Are used when outlets are larger than given in the above table, therefore have same dimensions as straight size fittings.

The dimensions of "Reducing Flanged Fittings" are always regulated by the reduction of the outlet.

FITTINGS REDUCING ON THE RUN ONLY, the long body pattern will always be used, except double sweep tees, on which the reduced end is always longer than the regular fitting. Dimensions on request.

BULL HEADS OR TEES having outlets larger than the run, will be the same length center to face of all openings as a Tee with all openings of the size of the outlet. For example, a 12x12x18-inch Tee will be governed by the dimensions of the 18-inch Long Body Tee, namely, 18 inches center to face of all openings and 36 inches face to face.

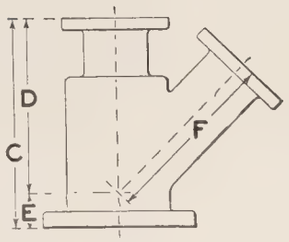
REDUCING ELBOWS carry same center to face dimension as regular elbows of largest straight size.

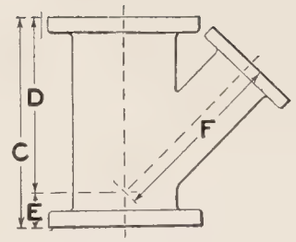
AMERICAN STANDARD

EXTRA HEAVY FLANGED FITTINGS

CAST IRON, FERROSTEEL AND CAST STEEL

GENERAL DIMENSIONS OF REDUCING 45° LATERALS





SHORT BODY PATTERN

Size.....Inches	1	1¼	1½	2	2½	3	3½	4	4½	5	6	7	8	9	10	12	14	15	16	18	20	22	24
Size.....Millimeters	25	32	38	50	64	76	90	100	113	125	150	175	200	225	250	300	350	375	400	450	500	550	600
*Size of Branch & Smaller..Inches	All reducing fittings 1 to 16-inch, inclusive, have same center to face dimensions as straight size fittings.																			9	10	10	12
*Size of Br. & Smaller.Millimeters																				225	250	250	300
C–Face to Face, Run .....Inches																				34	37	40	44
D–Center to Face, Run ...Inches																				31	34	37	41
E–Center to Face, Run. ..Inches																				3	3	3	3
F–Center to Face, Branch Inches																				32½	36	39	43

***LONG BODY PATTERNS**—Are used when branches are larger than given in the above table, therefore have same dimensions as straight size fittings.

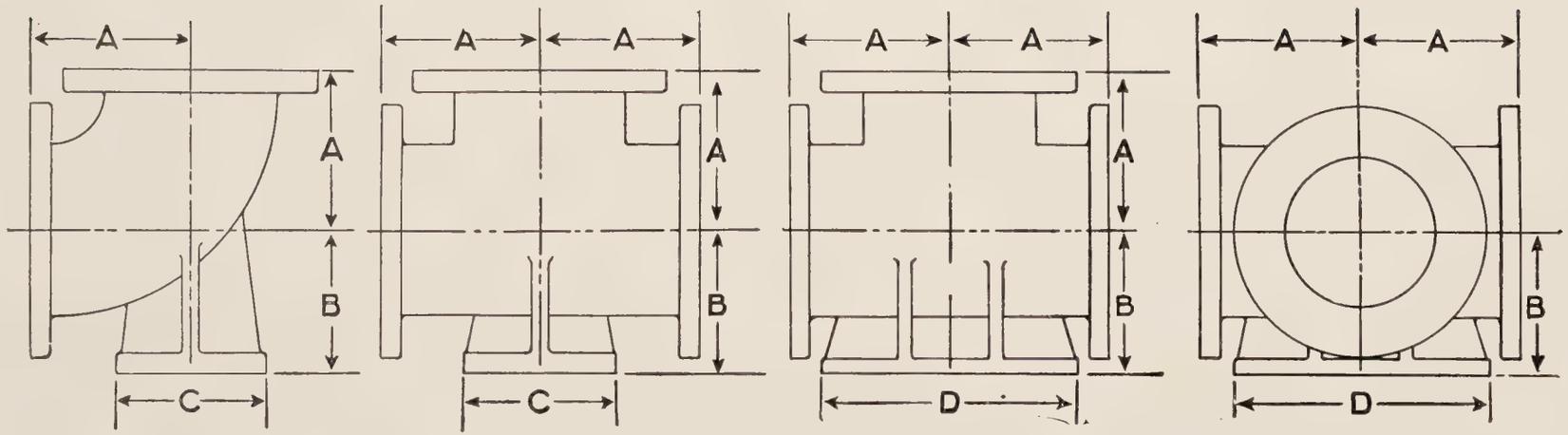
The dimensions of Reducing Flanged Fittings are always regulated by the reduction of the branch; fittings reducing on the run only, the long body pattern will always be used.

LOW PRESSURE AND STANDARD

BASE AND ANCHORAGE FITTINGS

CAST IRON

GENERAL DIMENSIONS



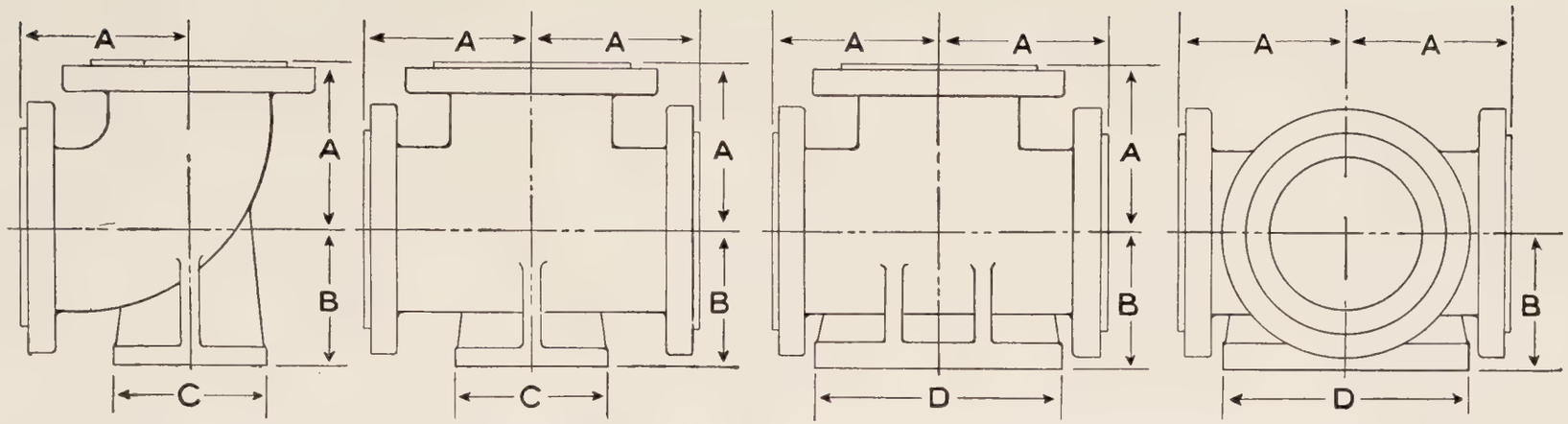
Size.....Inches	4	4½	5	6	7	8	9	10	12	14	15	16	18	20	22	24
Size.....Millimeters	100	113	125	150	175	200	225	250	300	350	375	400	450	500	550	600
A—Center to Face, Ells and Tees.....Inches	6½	7	7½	8	8½	9	10	11	12	14	14½	15	16½	18	20	22
B—Center to Face, Base Flange.....Inches	6½	6¾	7	7½	8¼	8¾	9½	10	10½	13½	14	14¾	15½	16¾	17¾	18¾
C—Base Flange—Across Flats of Square or Diam. of Round..Inches	6	6	7	7	7	9	9	9	11	11	11	11	13½	13½	13½	13½
D—Anchorage Flange, Across Flats of Square.....Inches	9	9¼	10	11	12½	13½	15	16	19	21	22¼	23½	25	27½	29½	32
Size of Pipe Support for Round Base Flange.....Inches	2	2	2½	2½	2½	4	4	4	6	6	6	6	8	8	8	8

FOR OTHER DIMENSIONS, SEE PAGES 652 TO 654

BASE AND ANCHORAGE FITTINGS

CAST IRON, FERROSTEEL AND CAST STEEL

GENERAL DIMENSIONS



BASE ELL ROUND OR SQUARE BASE

BASE TEE ROUND OR SQUARE BASE

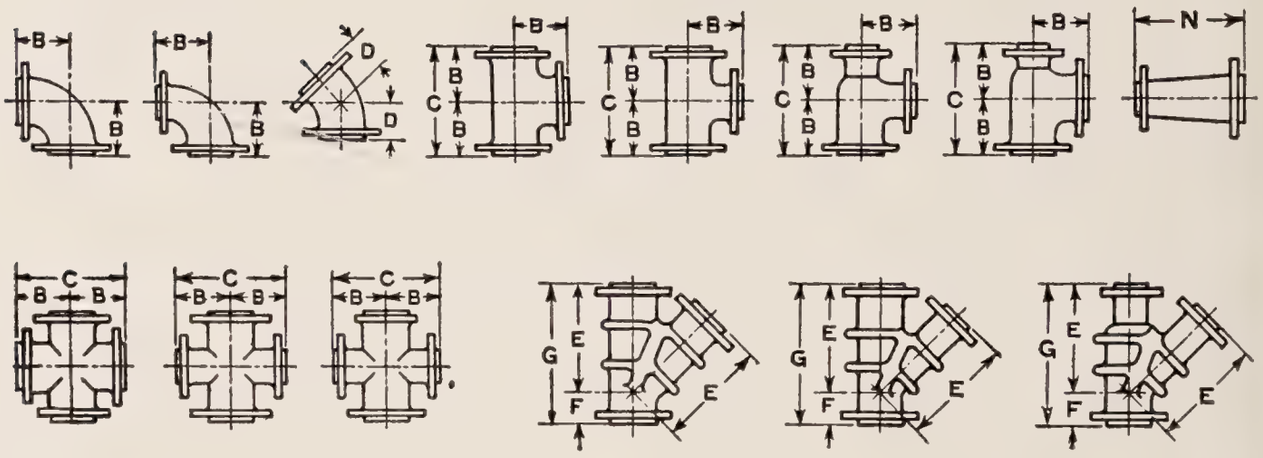
ANCHORAGE TEES SQUARE BASE

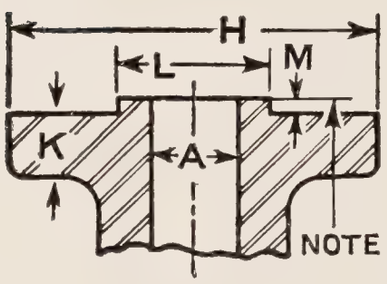
Size.....Inches	4	4½	5	6	7	8	9	10	12	14	15	16
Size.....Millimeters	100	113	125	150	175	200	225	250	300	350	375	400
A—Center to Face, Ells and Tees.....Inches	7	7½	8	8½	9	10	10½	11½	13	15	15½	16½
B—Center to Face, Base Flange.....Inches	7	7¼	7½	8	8¾	9¼	10	10½	11	14	14½	15¼
C—Base Flange—Across Flats of Square or Diameter of Round...Inches	6½	6½	7½	7½	7½	10	10	10	12½	12½	12½	12½
D—Anchorage Base, Across Flats of Square.....Inches	10	10½	11	12½	14	15	16	17	19	22½	23½	25
Size of Pipe Support for Round Base.....Inches	2	2	2½	2½	2½	4	4	4	6	6	6	6

FOR OTHER DIMENSIONS, SEE PAGES 656 TO 658

800 POUND
AMERICAN HYDRAULIC STANDARD
FERROSTEEL

GENERAL DIMENSIONS





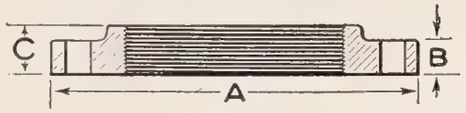
NOTE ALL CENTER TO FACE AND FACE TO FACE DIMENSIONS ARE MEASURED FROM THE FACE OF RAISED FACE.

Size Inches	Size Millimeters	Inside Dia. at Port A	Center to face Elbows Tee Cross B	Center to face 45° Elbow D	Center to face Lateral E	Center to face Lateral F	Dia. of Flange H	Thickness of Flange K	Dia. of Raised Face L	Height of Raised Face M	Face to Face Taper Reducers N
1/2	13	1/2	3 1/4	2	5 1/2	1 3/4	3 1/2	9/16	1 3/8	1/4	4 1/2
3/4	19	3/4	3 3/4	2 1/4	6	2	4	5/8	1 11/16	1/4	4 1/2
1	25	1	4 1/4	2 1/4	6 3/4	2 1/4	4 1/2	11/16	2	1/4	4 1/2
1 1/4	32	1 1/4	4 1/2	2 3/4	7 1/2	2 1/2	5	3/4	2 1/4	1/4	4 1/2
1 1/2	38	1 1/2	4 3/4	3	8 3/4	2 3/4	6	13/16	2 7/8	1/4	4 1/2
2	50	2	5 3/4	4 1/4	11	3 1/2	6 3/4	1 1/4	3 5/8	1/4	5
2 1/2	64	2 1/2	6 1/2	4 1/2	12 1/2	3 1/2	7 1/2	1 3/8	4 1/8	1/4	5 1/2
3	76	3	7	5	13 1/2	4	8 1/2	1 1/2	5	1/4	6
3 1/2	90	3 1/2	7 1/2	5 1/2	14 1/2	4 1/2	9 1/2	1 5/8	5 1/2	1/4	6 1/2
4	100	4	8 1/2	6	16 1/2	4 1/2	10 3/4	1 7/8	6 3/16	1/4	7
4 1/2	113	4 1/2	9	6 1/2	17 1/2	5 1/2	11 1/2	2	6 3/4	1/4	7 1/2
5	125	5	10	7	19 1/2	6	13	2 1/8	7 5/16	1/4	8
6	150	6	11	7 1/2	21	6 1/2	14	2 1/4	8 1/2	1/4	9
7	175	7	12	8	22 1/2	6 1/2	15	2 3/8	9 5/8	1/4	10
8	200	8	13	8 1/2	24 1/2	7	16 1/2	2 1/2	10 5/8	1/4	11
9	225	9	14 1/2	9	27 1/2	7 1/2	18 1/2	2 3/4	11 5/8	1/4	11 1/2
10	250	10	15 1/2	9 1/2	29 1/2	8	20	2 7/8	12 3/4	1/4	12
12	300	12	16 1/2	10	31 1/2	8 1/2	22	3	15	1/4	14

STANDARD COMPANION FLANGES

CAST IRON, MALLEABLE IRON, FERROSTEEL, CAST STEEL, FORGED STEEL

GENERAL DIMENSIONS



Size ..... Inches	¾	1	1¼	1½	2	2½	3	3½	4	4½	5	6	7	8	9	10	12	14	15	16	18	20	22	24
Size ..... Millimeters	19	25	32	38	50	64	76	90	100	113	125	150	175	200	225	250	300	350	375	400	450	500	550	600
A—Diameter of Flange .. In.	3½	4	4½	5	6	7	7½	8½	9	9¼	10	11	12½	13½	15	16	19	21	22¼	23½	25	27½	29½	32
B—Thickness of Flange .. In.	7/16	7/16	½	9/16	5/8	11/16	¾	13/16	15/16	15/16	15/16	1	1 1/16	1 1/8	1 1/8	1 3/16	1 1/4	1 3/8	1 3/8	1 7/16	1 9/16	1 11/16	1 13/16	1 7/8
C—Length of Hub ..... In.	5/8	11/16	¾	7/8	1	1 1/16	1 1/8	1 3/16	1 3/16	1 1/4	1 5/16	1 7/16	1½	1 5/8	1¾	1 7/8	2 1/16	2 3/16	2 5/16	2 7/16	2 5/8	2¾	2 7/8	3

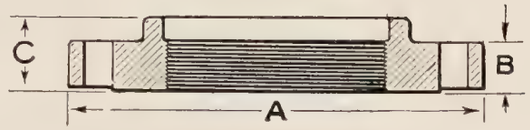
NOTE—Sizes 14-in. and larger are tapped for O. D. pipe.

TEMPLATES FOR DRILLING, PAGE 596

EXTRA HEAVY COMPANION FLANGES

CAST IRON, MALLEABLE IRON, FERROSTEEL, CAST STEEL, FORGED STEEL

GENERAL DIMENSIONS



Size.....Inches	1	1¼	1½	2	2½	3	3½	4	4½	5	6	7	8	9	10	12	14	15	16	18	20	22	24
Size.....Millimeters	25	32	38	50	64	76	90	100	113	125	150	175	200	225	250	300	350	375	400	450	500	550	600
A—Diameter of Flange.....Inches	4½	5	6	6½	7½	8¼	9	10	10½	11	12½	14	15	16¼	17½	20½	23	24½	25½	28	30½	33	36
B—Thickness of Flange....Inches	11/16	3/4	13/16	7/8	1	1 1/8	1 3/16	1 1/4	1 5/16	1 3/8	1 7/16	1 1/2	1 5/8	1 3/4	1 7/8	2	2 1/8	2 3/16	2 1/4	2 3/8	2 1/2	2 5/8	2 3/4
C—Length of Hub.....Inches	1	1 1/8	1 1/4	1 3/8	1 7/16	1 9/16	1 5/8	1 3/4	1 13/16	1 7/8	2	2 1/16	2 3/16	2 1/4	2 3/8	2 9/16	2 11/16	2 13/16	2 7/8	3 1/16	3 1/4	3 7/16	3 5/8

TEMPLATES FOR DRILLING, PAGE 598

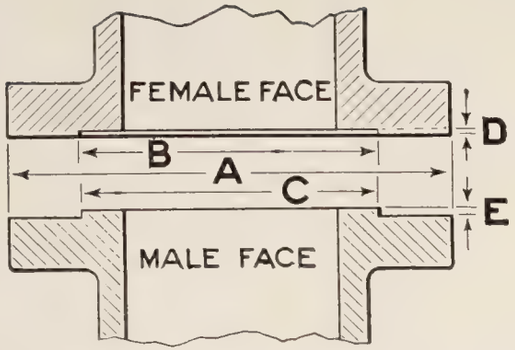
FOR DIMENSIONS OF SPECIAL FACINGS, SEE PAGE 665

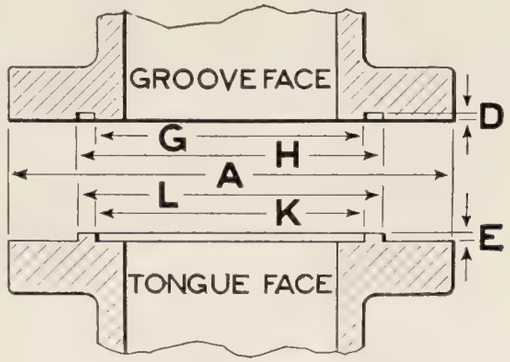
NOTE—Sizes 14 in. and larger are tapped for O. D. pipe.

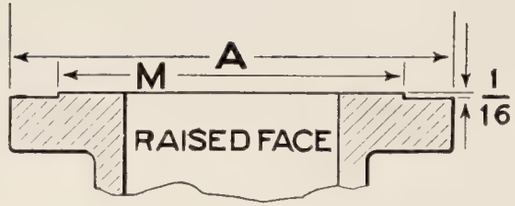
EXTRA HEAVY FLANGES

CAST IRON, FERROSTEEL AND CAST STEEL

GENERAL DIMENSIONS OF VARIOUS FACINGS







Size ..... Inches	1	1¼	1½	2	2½	3	3½	4	4½	5	6	7	8	9	10	12	14	15	16	18	20	22	24
Size ..... Millimeters	25	32	38	50	64	76	90	100	113	125	150	175	200	225	250	300	350	375	400	450	500	550	600
A–Diameter of Flange ..... Inches	4½	5	6	6 1/2	7½	8¼	9	10	10 1/2	11	12½	14	15	16¼	17½	20½	23	24½	25½	28	30 1/2	33	36
B–Diameter Recess, Female. . Inches	2 3/8	2 13/16	3 3/16	3 11/16	4 3/16	5 1/16	5 9/16	6 1/16	6 9/16	7 5/16	8 7/16	9 7/16	10 11/16	11 11/16	12 13/16	15 5/16	16 9/16	17 9/16	18 9/16	21 1/16	23 1/16	25 9/16	27 9/16
C–Diameter of Male ..... Inches	2 5/16	2 3/4	3 1/8	3 5/8	4 1/8	5	5 1/2	6	6 1/2	7 1/4	8 3/8	9 3/8	10 5/8	11 5/8	12 3/4	15 1/4	16 1/2	17 1/2	18 1/2	21	23	25 1/2	27 1/2
D–Depth of Recess ..... Inches	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	3/16	3/16	3/16	3/16	3/16	3/16	3/16	3/16	3/16	3/16	3/16	3/16
E–Height of Face ..... Inches	3/16	3/16	3/16	3/16	3/16	3/16	3/16	3/16	3/16	3/16	3/16	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4
G–Inside Diameter Groove . . Inches	1 11/16	2 1/16	2 11/16	3 1/16	3 9/16	4 3/16	4 11/16	5 3/16	5 11/16	6 3/16	7 7/16	8 9/16	9 9/16	10 9/16	11 9/16	13 9/16	15 13/16	17 1/16	18 5/16	20 5/16	22 1/4	24 7/16	26 7/16
H–Outside Diameter Groove. Inches	2 9/16	3 1/16	3 11/16	4 3/16	4 11/16	5 5/16	5 13/16	6 5/16	6 13/16	7 5/16	8 9/16	9 11/16	10 15/16	11 15/16	13 3/16	15 3/16	17 7/16	18 11/16	20 3/16	22 7/16	24 3/8	26 9/16	28 9/16
K–Inside Diameter Tongue. Inches	1 3/4	2 1/8	2 3/4	3 1/8	3 5/8	4 1/4	4 3/4	5 1/4	5 3/4	6 1/4	7 1/2	8 5/8	9 5/8	10 5/8	11 5/8	13 5/8	15 7/8	17 1/8	18 3/8	20 3/8	22 5/16	24 1/2	26 1/2
L–Outside Diameter Tongue. Inches	2 1/2	3	3 5/8	4 1/8	4 5/8	5 1/4	5 3/4	6 1/4	6 3/4	7 1/4	8 1/2	9 5/8	10 7/8	11 7/8	13 1/8	15 1/8	17 3/8	18 5/8	20 1/8	22 3/8	24 5/16	26 1/2	28 1/2
M–Diameter of Raised Face Cast Iron and Ferrosteel. . . . Inches	2 9/16	3 1/16	3 11/16	4 3/16	4 15/16	5 11/16	6 5/16	6 15/16	7 9/16	8 5/16	9 11/16	10 13/16	11 15/16	12 13/16	14 1/16	16 7/16	18 15/16	20 1/16	21 1/16	23 5/16	25 7/16	27 9/16	30 3/16
M–Diam. of Raised Face—Steel. In.	2	2 1/4	2 7/8	3 5/8	4 1/8	5	5 1/2	6 3/16	6 3/4	7 5/16	8 1/2	9 5/8	10 5/8	11 5/8	12 3/4	15	17 1/4	18 3/8	19 3/8	21½	23½	25 3/4	27 3/4

FOR DRILLING TEMPLATES, SEE PAGE 598

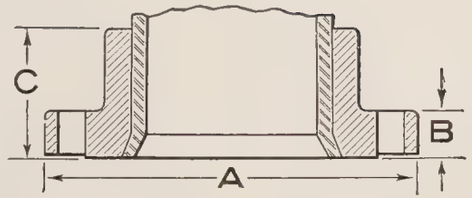
SIZES 14-INCH AND LARGER ARE FOR USE WITH O. D. PIPE

EXTRA HEAVY FLANGES

CRANELAP CRANEWELD SHRINK

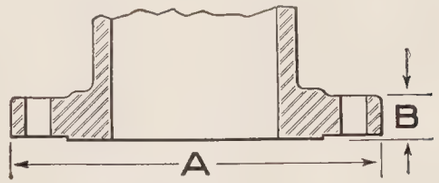
GENERAL DIMENSIONS

SHRINK



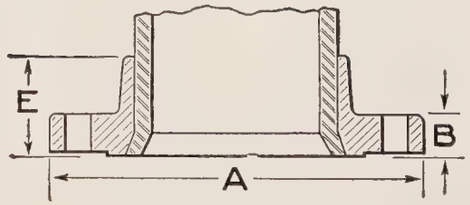
CAST IRON FERROSTEEL
CAST STEEL

CRANEWELD



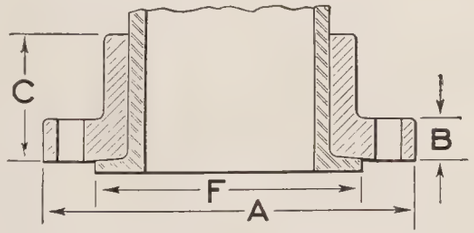
FORGED STEEL

SHRINK



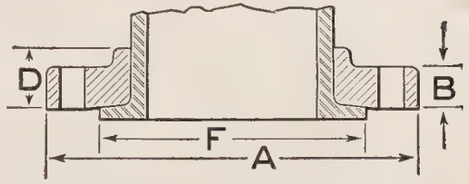
FORGED STEEL

CRANELAP LONG HUB



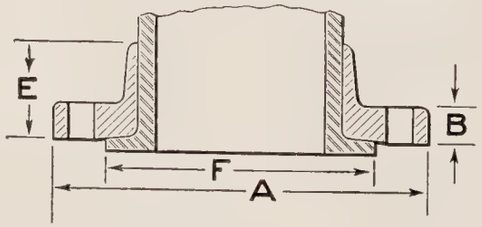
CAST IRON FERROSTEEL

CRANELAP SHORT HUB



MALLEABLE IRON CAST STEEL FORGED STEEL

CRANELAP LONG HUB



FORGED STEEL

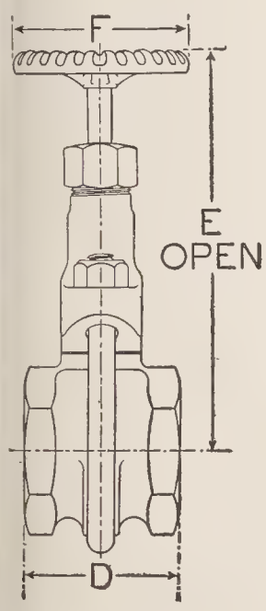
Size.....Inches	4	4½	5	6	7	8	9	10	12	14	15	16	18	20	22	24
Size.....Millimeters	100	113	125	150	175	200	225	250	300	350	375	400	450	500	550	600
A—Diameter of Flange.....Inches	10	10½	11	12½	14	15	16¼	17½	20½	23	24½	25½	28	30½	33	36
B—Thickness of Flange.....Inches	1¼	1 5/16	1⅜	1 7/16	1½	1⅝	1¾	1⅞	2	2⅛	2 3/16	2¼	2⅜	2½	2⅝	2¾
C—Length of Hub, Regular.....Inches	3¾	3 15/16	4⅛	4¼	4 7/16	4⅝	4 13/16	4 15/16	5 5/16	5½	5⅝	6	6¼	6½	6⅞	7¼
D—Length of Hub, Short.....Inches	1¾	1 13/16	1⅞	2	2 1/16	2 3/16	2¼	2⅜	2 9/16	2 11/16	2 13/16	2⅞	3 1/16	3¼	3 7/16	3⅝
E—Length of Hub, Forged Steel.....Inches	3¼	3 5/16	3⅜	3 7/16	3 9/16	3¾	3 15/16	4⅛	4⅜	4¾	4⅞	5⅛	5⅜	5⅞	6⅛	6 9/16
F—Diameter of Lap.....Inches	6 3/16	6¾	7 5/16	8½	9⅝	10⅝	11⅝	12¾	15	17¼	18⅜	19⅜	21½	23½	25¾	27¾

Templates for drilling, page 598. For dimensions of special facings of Flanges, see page 665.
Sizes 14-inch and larger are for use with O. D. pipe.

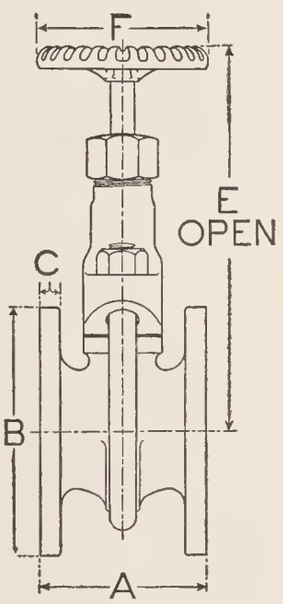
CLAMP GATE VALVES

GENERAL DIMENSIONS

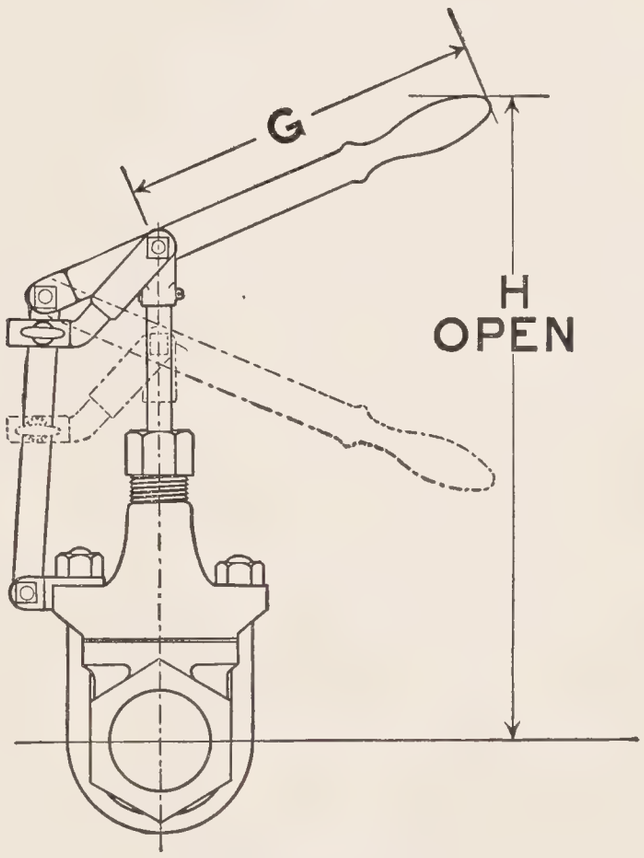
CATALOGUE Nos. 488, 488½, 490, 490½, 492, 492½, 494, 494½



SCREWED



FLANGED

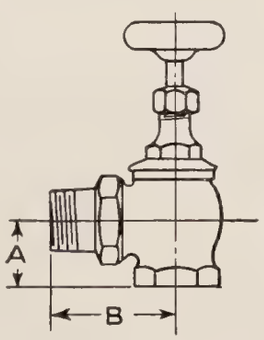


QUICK OPENING

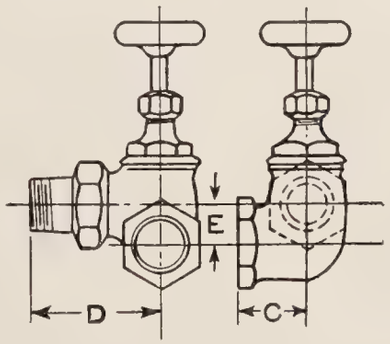
Size.....Inches	½	¾	1	1¼	1½	2	2½	3	3½	4
Size.....Millimeters	13	19	25	32	38	50	64	76	90	100
A—Face to Face, Flanged.....			3 3/16	3½	3¾	4	4 15/16	5 1/16	5 15/16	6¾
B—Diameter of Flanges.....			4	4½	5	6	7	7½	8½	9
C—Thickness of Flanges.....			7/16	½	9/16	5/8	11/16	¾	13/16	15/16
D—End to End, Screwed.....	2 1/16	2 5/16	2 9/16	2 7/8	3 1/8	3 5/8	4 1/8	4 9/16	5 1/16	5 9/16
E—Center to Top of Stem, Open..	5¼	6¼	7 3/8	8½	9½	11½	13 7/8	15 3/8	17¾	20¼
F—Diameter of Wheel.....	2 1/16	2 9/16	2¾	3 1/16	3 5/8	4 1/16	4¾	5 3/8	6	8
G—Center of Valve to end of Lever	6	7	7	7	9	9	11 5/16	11 5/16	15¼	15¼
H—Center to top of Lever, Open..	7	8¼	9¾	11½	14¾	15¾	17¾	21½	23¼	28

The above dimensions are subject to a slight variation and change without notice.

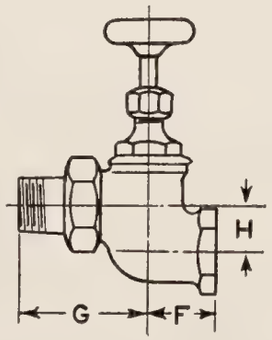
GENERAL DIMENSIONS OF RADIATOR VALVES AND FITTINGS



Nos. 112-124
220-67G



Nos. 113-144
222-145G



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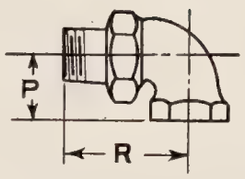
164



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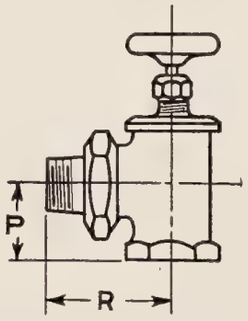
192



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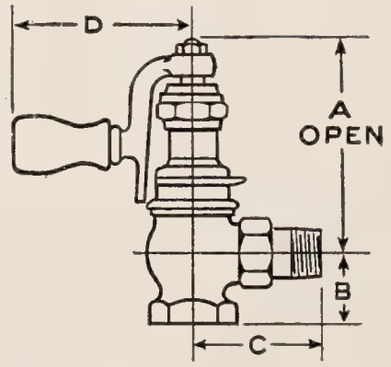
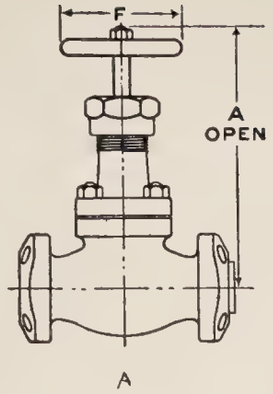


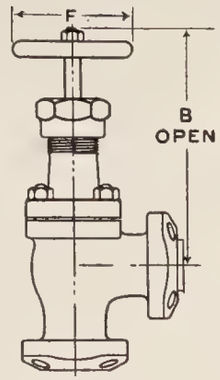
No.
231

Size Inches	Size Millimeters	No. 112		No. 113			Nos. 124 220					No. 144			No. 164					No. 67-G					No. 222					No. 174 192		No. 145-G			No. 231 Modulating			
		A	B	C	D	E	A	B	C	D	E	F	G	H	A	B	C	D	E	P	R	C	D	E	A	B	C	D
1/2	13	1 1/8	2 1/16	1 3/16	2 3/16	5/8	1 3/16	2 1/4	1 1/4	2 3/8	1/2				1 3/16	2 1/4	1 3/16	2 3/16	5/8	1 1/8	2				3 7/8	1 3/16	2 5/16	3 1/4
3/4	19	1 1/4	2 5/8	1 3/8	2 11/16	3/4	1 5/16	2 3/4	1 1/2	2 7/8	11/16	1 7/16	2 7/8	11/16	1 5/8	3 1/8	1 1/2	2 7/8	11/16	1 5/16	2 1/2	1 1/2	3 1/16	11/16	4	1 1/4	2 11/16	3 1/4
1	25	1 7/16	2 15/16	1 11/16	3	15/16	1 5/8	3 3/16	1 7/8	3 3/8	7/8	1 13/16	3 1/2	1	1 3/4	3 1/2	1 7/8	3 3/8	7/8	1 9/16	2 7/8	1 7/8	3 11/16	15/16	4	1 11/16	3 3/16	3 1/4
1 1/4	32	1 11/16	3 3/16	2	3 3/8	1 3/16	1 7/8	3 11/16	2 3/16	3 15/16	1	2	3 3/4	1	2	3 15/16	2 3/16	3 15/16	1	1 13/16	3 3/16	1 15/16	4	1	4 1/4	1 7/8	3 11/16	3 1/4
1 1/2	38	1 7/8	3 5/8	2 1/4	3 3/4	1 5/16	2 1/16	4 1/8	2 1/4	4 1/4	1 5/16	2 1/4	4 1/4	1 1/4	2 1/4	4 3/8	2 1/4	4 1/4	1 5/16	2 1/16	3 1/2	2 1/4	4 3/8	1 1/4				
2	50	2 5/16	4 1/4	2 3/4	4 3/8	1 11/16	2 9/16	4 7/8	2 5/8	4 15/16	1 11/16	2 5/8	5	1 5/8	2 13/16	5 1/8	2 5/8	4 15/16	1 11/16	2 1/2	4 1/8	2 5/8	5 1/16	1 5/8				

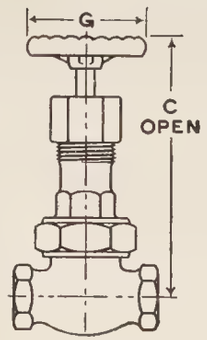
GLOBE, ANGLE AND EXPANSION VALVES



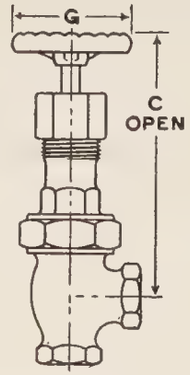
GLOBE



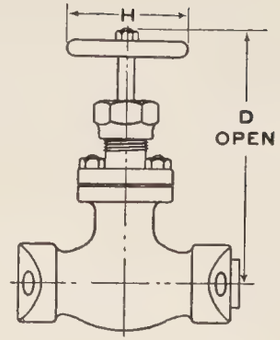
ANGLE



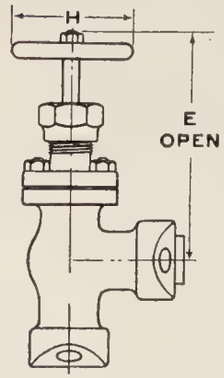
REGRINDING GLOBE



REGRINDING ANGLE



EXPANSION GLOBE



EXPANSION ANGLE

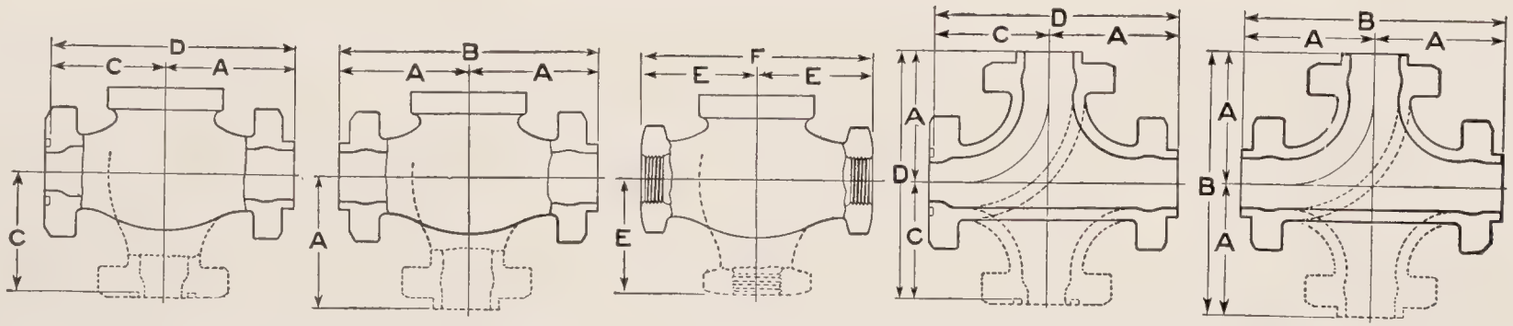
Size of Valve..... Inches	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	5	6
Size of Valve ..... Millimeters	6	10	13	19	25	32	38	50	64	76	90	100	125	150
A—1501, 1504 Globes..... Inches	7 3/16	7 3/16	7 3/16	9 1/16	9 3/16	11 1/16	11 5/16	12 1/4	12 5/8	14 1/8	14 13/16	16 1/8	16 15/16	20
B—1503, 1505 Angles..... Inches	6 3/4	6 3/4	6 3/4	8 5/16	8 3/8	10 1/8	10 1/4	10 15/16	11 1/4	12 7/8	13 1/8	14 5/16	15 1/8	17 15/16
C—1504 1/2, 1505 1/2 Regrinding Globes and Angles In.	6 3/16	6 1/2	6 5/8	8 3/16	8 3/4									
D—1511, 1513, 1519, 1519 1/2 Expansion Globes Inches	7 1/2	7 1/2	7 1/2	7 1/2	7 1/2									
E—1515, 1517, 1519 1/4, 1519 3/4 Expansion Angles..In.	7	7	7	7	7									
F—1501, 1503, 1504, 1505 Globes and Angles..Inches	3 5/8	3 5/8	3 5/8	4 1/16	4 1/16	4 3/4	5 3/8	6 1/2	6 1/2	7 1/2	9	10	12	14
G—1504 1/2, 1505 1/2 Regrinding Globes and Angles.In.	2 3/4	2 3/4	2 3/4	3 5/8	3 5/8									
H—1511, 1513, 1515, 1517, 1519, 1519 1/4, 1519 1/2, 1519 3/4 Expansion Globes and Angles..... Inches	3 1/2	3 1/2	3 1/2	3 1/2	3 1/2									

For other dimensions, see page 670. For dimensions of Valves larger than 6-inch, see page 671. Templates for drilling and Tongue and Groove dimensions, page 674.

CENTER-TO-FACE AND FACE-TO-FACE DIMENSIONS OF

ALL TONGUE AND GROOVE VALVES AND FITTINGS FOR AMMONIA

6-INCH AND SMALLER



TONGUE AND GROOVE | BOYLE END | SCREW END | TONGUE AND GROOVE | BOYLE END

Style of Flange	Oval				Square					Round				
Size of Valve or Fitting ..... Inches	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	5	6
Size of Valve or Fitting ..... Millimeters	6	10	13	19	25	32	38	50	64	76	90	100	125	150
A—Center to Face of Tongue End Valves, Elbows, Tees or Crosses In.	2 7/8	3	3 1/8	3 3/8	3 9/16	4	4 3/8	4 7/8	5 9/16	6 13/16	7 5/16	7 11/16	8 11/16	9 11/16
*B—Face to Face of Boyle End Valves, Tees or Crosses .... Inches	5 3/4	6	6 1/4	6 3/4	7 1/8	8	8 3/4	9 3/4	11 1/8	13 5/8	14 5/8	15 3/8	17 3/8	19 3/8
C—Center to Face of Groove End Valves, Elbows, Tees or Crosses In.	2 7/16	2 9/16	2 11/16	2 15/16	3 1/8	3 3/8	3 3/4	4 1/4	4 3/4	6	6 1/2	6 7/8	7 3/4	8 3/4
D—Face to Face of Tongue and Groove Valves, Tees or Crosses. In.	5 5/16	5 9/16	5 13/16	6 5/16	6 11/16	7 3/8	8 1/8	9 1/8	10 5/16	12 13/16	13 13/16	14 9/16	16 7/16	18 7/16
E—Center to End of Plain Screw Valves ..... Inches	2 1/4	2 3/8	2 1/2	2 3/4	3 1/8	3 3/8	3 3/4	4 1/4						
F—End to End of Plain Screw Valves ..... Inches	4 1/2	4 3/4	5	5 1/2	6 1/4	6 3/4	7 1/2	8 1/2						

NOTE. ON TONGUE AND GROOVE VALVES THE GROOVE END IS ON THE END NEXT TO THE UNDER SIDE OF DISC; AND THE TONGUE END OR ENDS ON THE END OR ENDS NEXT TO THE UPPER SIDE OF DISC.

*Made to order only.

For other dimensions, see page 669.

Templates for drilling, and tongue and groove dimensions, page 674.

For sizes 7-inch and larger, see page 671.

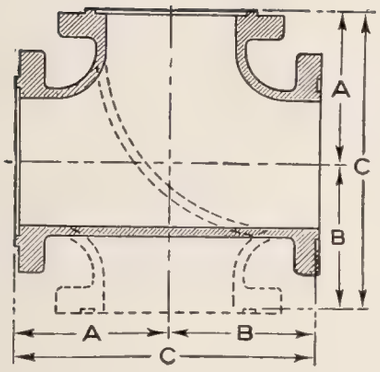
CENTER-TO-FACE AND FACE-TO-FACE

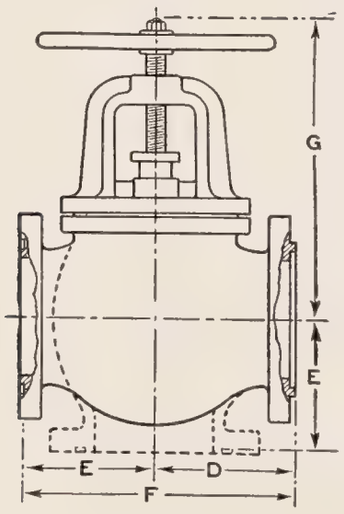
DIMENSIONS OF

ALL VALVES AND FITTINGS

FOR AMMONIA

7-INCH AND LARGER





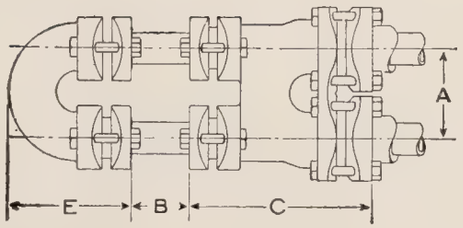
Size of Valve or Fitting ..... Inches	7	8	10	12
Size of Valve or Fitting ..... Millimeters	175	200	250	300
A—Center to Face of Tongue End Ells, Tees and Crosses ..... Inches	9 1/4	10 1/4	11 3/4	13 1/4
B—Center to Face of Groove End Ells, Tees and Crosses ..... Inches	8 13/16	9 13/16	11 5/16	12 13/16
C—Face to Face of Tongue and Groove, Tees and Crosses ..... Inches	18 1/16	20 1/16	23 1/16	26 1/16
D—Center to Face of Tongue End Globe, Angle and Cross Valves ..... Inches	9 7/8	10 3/4	12 1/2	14 1/4
E—Center to Face of Groove End Globe, Angle and Cross Valves ..... Inches	9 7/16	10 5/16	12 1/16	13 13/16
F—Face to Face of Tongue and Groove Globe and Cross Valves ..... Inches	19 5/16	21 1/16	24 9/16	28 1/16
G—Center to Top of Valve, Open ..... Inches	26 1/4	29 1/2	33 1/2	33 1/2

NOTE.—ON TONGUE AND GROOVE VALVES THE GROOVE END IS ON THE END NEXT TO THE UNDER SIDE OF DISC; AND THE TONGUE END OR ENDS ON THE END OR ENDS NEXT TO THE UPPER SIDE OF DISC.

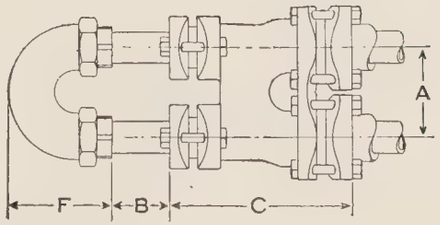
For Templates for drilling, and Tongue and Groove dimensions, see page 674.

DOUBLE PIPE RETURN BENDS

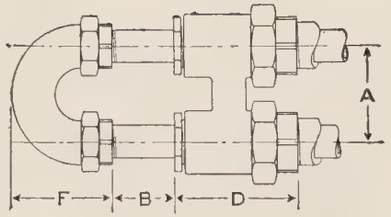
GENERAL DIMENSIONS



No. 1575 WITH FLANGED RETURN BEND No. 1574



No. 1575 WITH SCREWED RETURN BEND No. 1574½



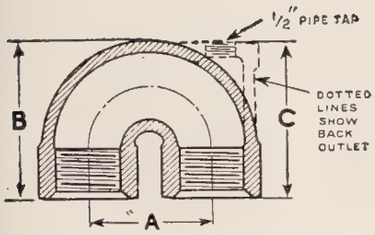
No. 1575½ WITH SCREWED RETURN BEND No. 1574½

Size	Inches	2x1¼	2½x1¼	2½x2x1¼	3x2	4x3
Size	Millimeters	50x32	64x32	64x50x32	76x50	100x76
A—Center to Center	Inches	4⅝	4⅝	4⅝	6	8
B—Space for Packing	Inches	3	3	3	3	3
C—Length of Body, No. 1575	Inches	9⅜	9⅝	9⅝	10½	13¼
D—Length of Body, No. 1575½	Inches	6⅜				
E—Height of Bend, No. 1574	Inches	6	6	6	7½	
F—Height of Bend, No. 1574½	Inches	5¼	5¼	5¼	6¾	9

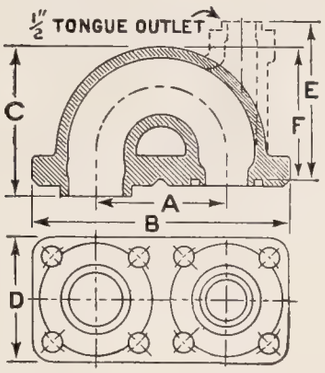
These dimensions are subject to a slight variation and change without notice.

AMMONIA RETURN BENDS

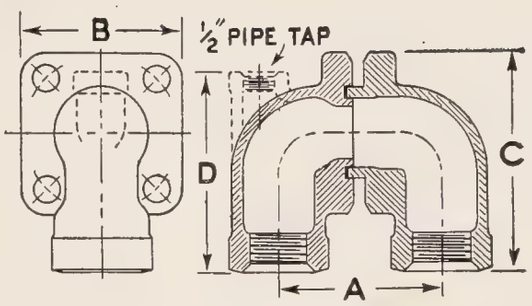
GENERAL DIMENSIONS



No. 1562—PLAIN
No. 1564—WITH BACK OUTLET



No. 1559—PLAIN
No. 1561—WITH BACK OUTLET



No. 1570—PLAIN
No. 1572—WITH BACK OUTLET

SCREWED ENDS WITH SOLDERING RECESS

Size.....Inches	1	1	1	1¼	1¼	1¼
Size.....Millimeters	25	25	25	32	32	32
Dimension A.....Inches	1¾	2½	3	2¼	2½	3
Dimension B.....Inches	2⅞	3¼	3½	3 9/16	3 11/16	3 15/16
Size.....Inches	1¼	1¼	1¼	1½	1½	1½
Size.....Millimeters	32	32	32	38	38	38
Dimension A.....Inches	3½	4	6	3	6	8
Dimension B.....Inches	4 3/16	4 7/16	5	4 3/16	5 11/16	6 11/16
Dimension C.....Inches			5			
Size.....Inches	2	2	2	2	2	2
Size.....Millimeters	50	50	50	50	50	50
Dimension A.....Inches	3	3½	4	4⅝	6	8
Dimension B.....Inches	4⅝	4⅞	5⅛	5 7/16	6⅛	7⅛
Dimension C.....Inches		4 13/16	5			

TONGUE AND GROOVE ENDS

Size.....Inches	1¼	1¼	*2	2	2	2	2
Size.....Millimeters	32	32	50	50	50	50	50
Dimension A....Inches	4	6	4⅝	6	8	10	12
Dimension B....Inches	7 15/16	9 15/16	9⅛	11 1/16	13 1/16	15 1/16	17 1/16
Dimension C....Inches	4⅝	5⅝	6½	6 5/16	7 5/16	8 5/16	9 7/16
Dimension D...Inches	3 15/16	3 15/16	4½	5 1/16	5 1/16	5 1/16	5 1/16
Dimension E....Inches	5 1/16	5 7/16	7¼	6½	6¾	7 3/16	7¼
Dimension F....Inches	4⅛	5⅛	6	5 13/16	6 13/16	7 13/16	8 15/16

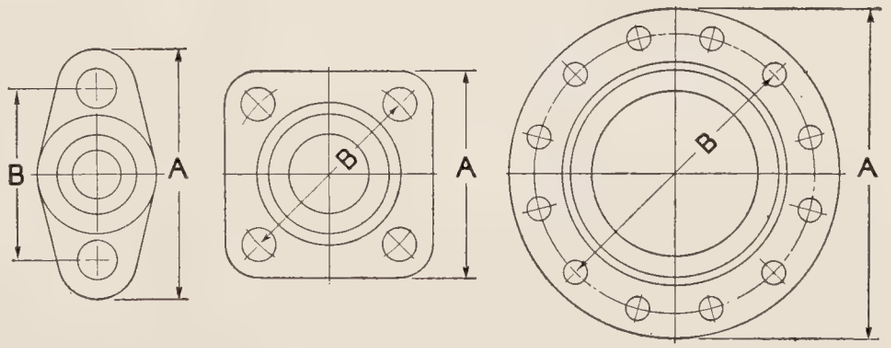
*On this return bend it is necessary to use special square flanges. Standard flanges are used on all other sizes.

DIVIDED SCREWED ENDS WITH SOLDERING RECESS

Size.....Inches	1¼	1¼	2	2	2	2
Size.....Millimeters	32	32	50	50	50	50
Dimension A.....Inches	4	6	3½	4	4⅝	6
Dimension B.....Inches	3 15/16	3 15/16	5 1/16	5 1/16	5 1/16	5 1/16
Dimension C.....Inches	5⅜	5⅜	7 1/16	7 1/16	7 1/16	7 1/16
Dimension D.....Inches		4¾	6⅝	6⅝	6⅝	

DIMENSIONS OF

GLANDS, FLANGES AND TEMPLATES FOR DRILLING



¼ TO 2-INCH, FORGED STEEL **2½ TO 6-INCH, MALLEABLE IRON** **7 TO 12-INCH, FERROSTEEL**

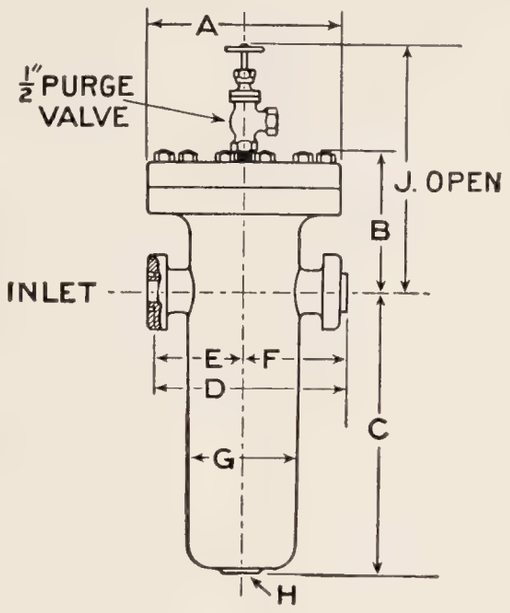
Style of Flange	Oval				Square					Round								
Size....Inches	¼	⅜	½	¾	1	1¼	1½	2	2½	3	3½	4	5	6	7	8	10	12
Size....Millimeters	6	10	13	19	25	32	38	50	64	76	90	100	125	150	175	200	250	300
A—Diameter of Flange....Inches	3 5/8	3 13/16	4	4 3/4	3 9/16	3 15/16	4 11/16	5 1/16	5 15/16	8¼	9	10	11	12½	14	15	17½	20½
B—Diameter of Bolt Circle....Inches	2 3/8	2 9/16	2¾	3¼	3¼	3¾	4½	5	5 7/8	6 5/8	7¼	7 7/8	9¼	10 5/8	11 7/8	13	15¼	17¾
Number of Bolts	2	2	2	2	4	4	4	4	4	8	8	8	8	12	12	12	16	16
Diameter of Bolts....Inches	½	½	½	⅝	½	½	⅝	⅝	¾	¾	¾	¾	¾	¾	⅞	⅞	1	1⅛
Length of Bolts for Boyle Joints. Ins.	2¾	2¾	2¾	3¼	2¾	3	3¼	3½	4¼	4¼	4½	4¾	5¼	5¼	.....	.....	.....	.....
Length of Bolts for Tongue and Groove Joints....Inches	2½	2½	2¾	3	2¾	3	3¼	3¾	4	4¼	4¼	4½	4¾	5	4¼	4½	5¼	5½
Inside Diameter of Tongue....Inches	19/32	23/32	⅞	1⅛	1⅜	1 11/16	1 15/16	2 7/16	2 15/16	3 9/16	4 1/16	4 9/16	5 5/8	6 11/16	8 5/8	9 5/8	11 5/8	13 5/8
Outside Diameter of Tongue....Inches	31/32	1 3/32	1 7/32	1 15/32	1 25/32	2 7/32	2 15/32	3 3/32	3 21/32	4 9/32	4 27/32	5 15/32	6 27/32	7 27/32	9 5/8	10 7/8	13 1/8	15 1/8
Inside Diameter of Groove....Inches	9/16	11/16	27/32	1 3/32	1 11/32	1 21/32	1 29/32	2 13/32	2 29/32	3 17/32	4 1/32	4 17/32	5 19/32	6 21/32	8 9/16	9 9/16	11 9/16	13 9/16
Outside Diameter of Groove....Inches	1	1⅛	1¼	1½	1 13/16	2¼	2½	3⅛	3 11/16	4 5/16	4⅞	5½	6⅞	7⅞	9 11/16	10 15/16	13 3/16	15 3/16

The Bolt Holes are ⅛-inch larger than diameter of bolts.

DIMENSIONS OF

OIL SEPARATORS

FOR AMMONIA



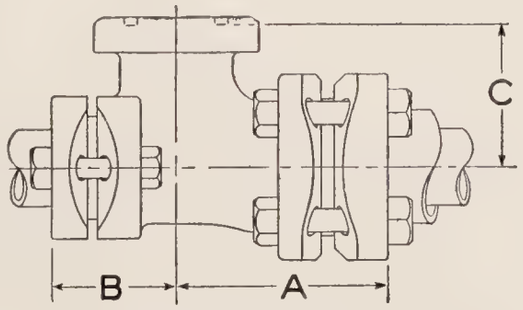
Style of Flange	Size . . . . . Inches	Size . . . Millimeters	A Diam. Top Flange Inches	B Cent. of Run to Top Inches	C Cent. of Run to Bottom Inches	D Face to Face Inches	E Cent. to Face, Groove End Inches	F Cent. to Face, Tongue End Inches	G Diam. Body Inches	H Size of Drain Inches	J Cent. of Run to Top of Purge Valve, Open Inches
Oval	¾	19	7½	5¾	11	7⅝	3⅝	4	4¼	½	14¼
SQUARE	1	25	11	7	12	11⅛	5⅝	5 13/16	7	½	15½
	1¼	32	11	7	12	11⅛	5⅝	5 13/16	7	½	15½
	1½	38	12½	8½	22½	14 3/16	6¾	7 7/16	9	¾	17¼
	2	50	12½	8½	22½	14 3/16	6¾	7 7/16	9	¾	17¼
	2½	64	12½	8½	22½	14 3/16	6¾	7 7/16	9	¾	17¼
ROUND	3	76	16	11⅜	25¾	18 11/16	9	9 11/16	12	1	19¾
	3½	90	16	11⅜	25¾	18 11/16	9	9 11/16	12	1	19¾
	4	100	16	11⅜	25¾	18 11/16	9	9 11/16	12	1	19¾
	5	125	20	13⅜	35¾	24 3/16	11¾	12 7/16	16	1¼	21¾
	6	150	20	13⅜	35¾	24 3/16	11¾	12 7/16	16	1¼	21¾

FOR FLANGE DIMENSIONS, SEE PAGE 674

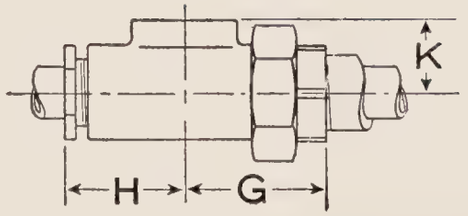
SPECIAL INLET AND OUTLET TEES

FOR DOUBLE PIPE CONDENSERS, BRINE COOLERS, AND WATER COOLERS

GENERAL DIMENSIONS



Nos. 1579 AND 1581
TEES

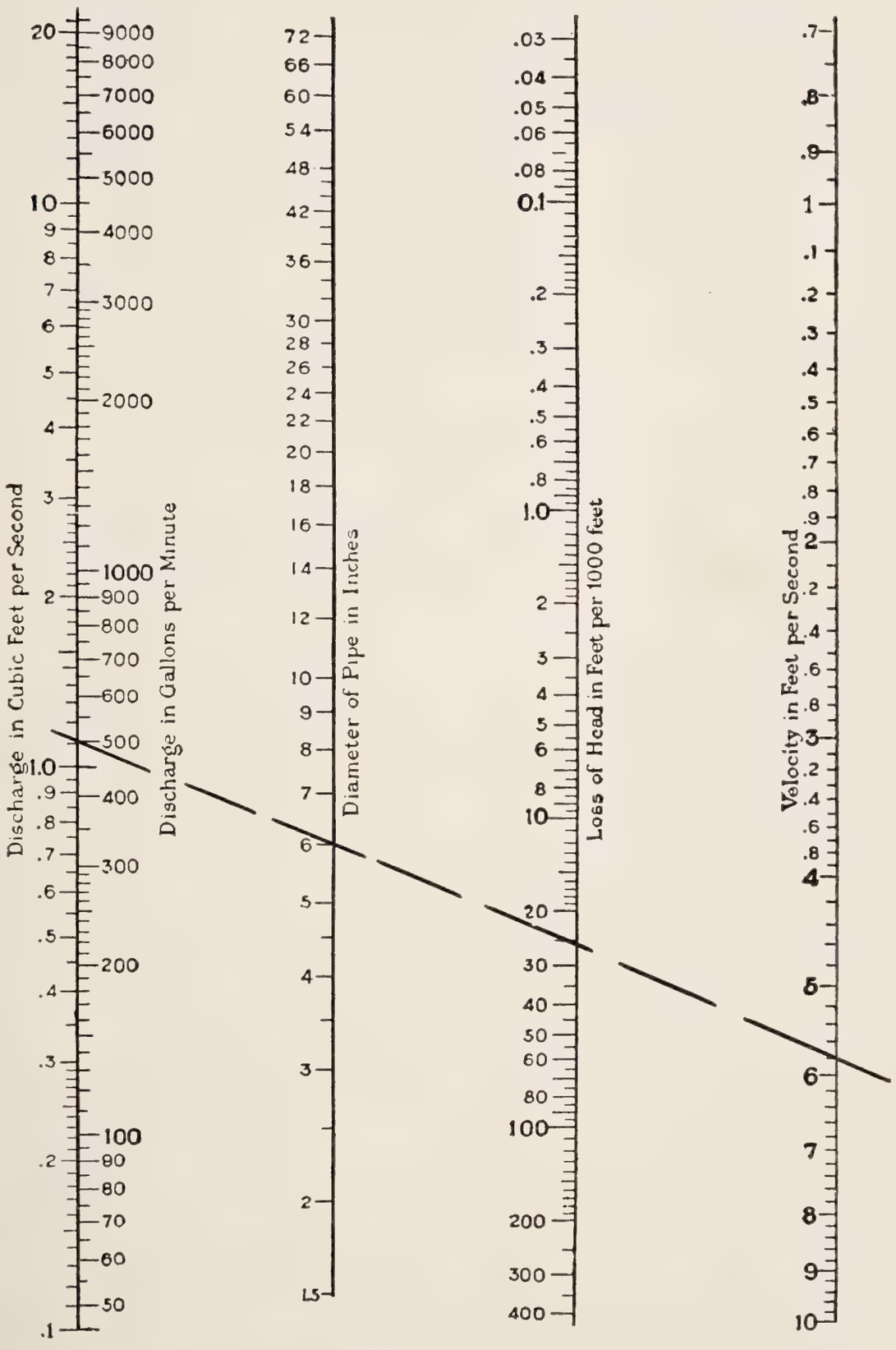


No. 1575¾
WATER COOLER TEE

Size Inches	Size Millimeters	Nos. 1579 and 1581			No. 1575¾		
		A Inches	B Inches	C Inches	G Inches	H Inches	K Inches
2 x1¼x ½	50x32x13	5¾	3⅝	3 7/16			
2 x1¼x ¾	50x32x19	5¾	3⅝	3 7/16			
2 x1¼x1	50x32x25	5¾	3⅝	3⅞			
2 x1¼x1¼	50x32x32	5¾	3⅝	3 11/16			
2 x1¼x1½	50x32x38	5¾	3¼	3 13/16			
2 x1¼x2	50x32x50	5¾	3⅝	3 11/16	4½	3⅝	2¼
2½x1¼x2	64x32x50	6⅜	3¼	3 13/16			
3 x2 x ½	76x50x13	6¾	3⅞	4⅞			
3 x2 x ¾	76x50x19	6⅛	4½	4⅜			
3 x2 x1¼	76x50x32	6¾	3⅞	4½			
3 x2 x1½	76x50x38	6¾	3⅞	4½			
3 x2 x2	76x50x50	6¾	3⅞	4⅜			

DIAGRAM FOR CALCULATING PIPE SIZES, DISCHARGE VELOCITIES AND LOSS OF HEAD IN WATER PIPE

Lay a straight-edge on scales at the points for any two known quantities and the unknown quantities will lie at the intersection of the straight edge with the other scales.

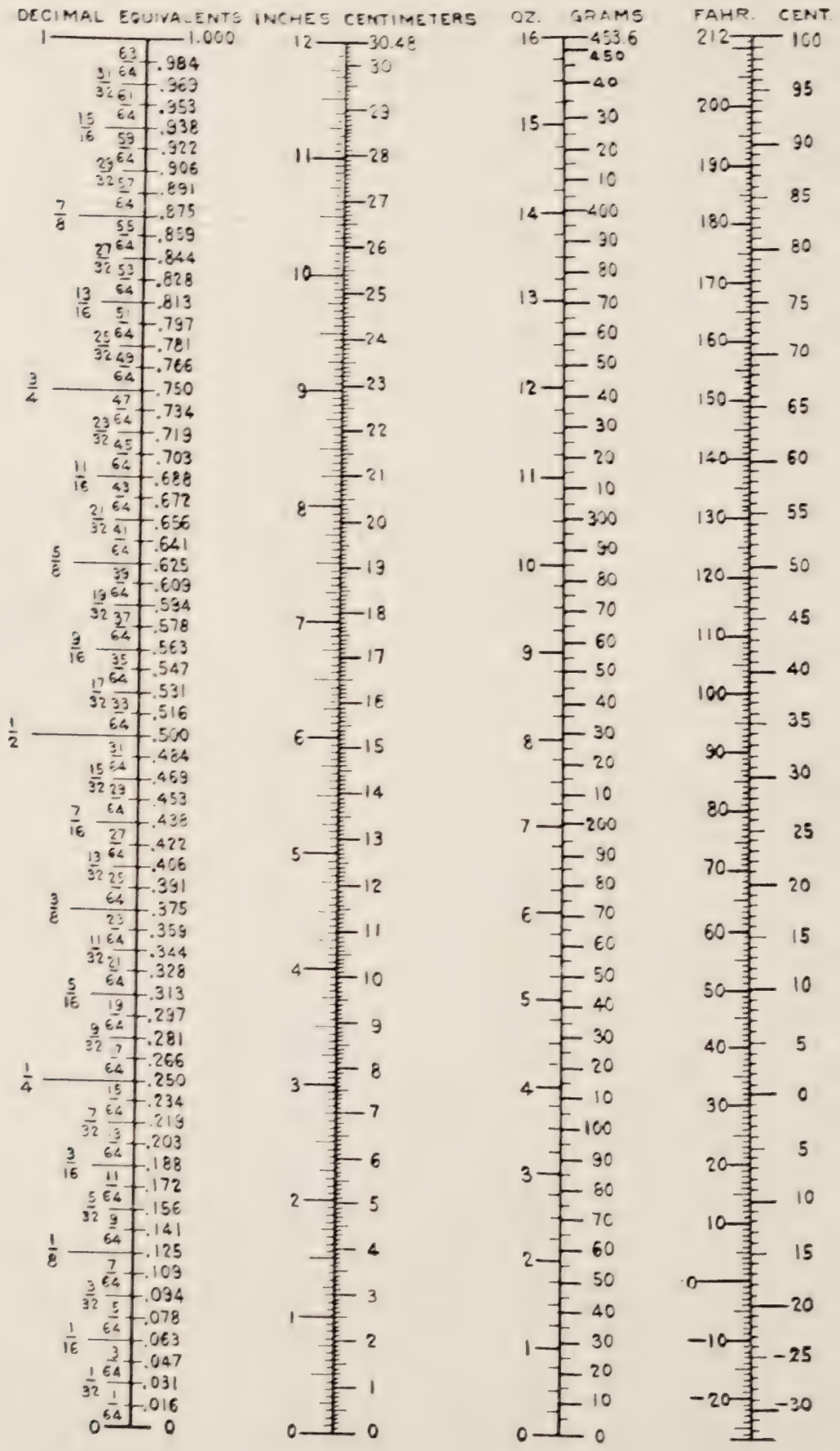

Discharge in Cubic Feet per Second
Discharge in Gallons per Minute
Diameter of Pipe in Inches
Loss of Head in Feet per 1000 feet
Velocity in Feet per Second

EXAMPLE

To discharge 500 gallons per minute through a 6-inch pipe, following the dotted line would show a loss of head in a thousand feet of approximately 25 feet head and a velocity of 5.8 feet per second.

DECIMAL EQUIVALENTS OF PARTS OF AN INCH AND CONVERSION CHART FOR METRIC LENGTHS, WEIGHTS AND TEMPERATURES

COURTESY OF THE NATIONAL TUBE COMPANY



THE CIRCLE

The circumference of a circle is equal to the diameter multiplied by 3.1416.

The area of a circle is equal to the square of the diameter multiplied by .7854.

To Find the Length of an Arc of a Circle.—Multiply the diameter of the circle by the number of degrees in the arc and this product by .0087266.

To Find the Area of a Sector of a Circle.—Multiply the number of degrees in the arc of the sector by the square of the radius and by .008727; or, multiply the arc of the sector by half its radius.

THE TRIANGLE

Varieties.—Right angled, having one right angle; obtuse angled, having one obtuse angle; isosceles, having two equal angles and two equal sides; equilateral, having three equal sides and equal angles.

The sum of the three angles of any triangle equals 180 degrees.

The two acute angles of a right angled triangle are complements of each other.

Hypothenuse of a right angled triangle, the side opposite the right angle, equals $\sqrt{\text{sum of the squares of the other two sides.}}$

To Find the Area of a Triangle.—Multiply the base by half the height.

The Area of a Triangle Being Given to Find the Length of the Base.—Base equals twice the area divided by perpendicular height.

Area of a Triangle Being Given to Find the Height.—Height equals twice area divided by base.

QUADRILATERAL FIGURE

To Find the Area.—Divide the figure into two triangles; the sum of the areas of the triangles is the area.

THE ELLIPSE

To Find the Area.—Multiply the two diameters together and the product by .7854.

THE SPHERE

To Compute the Surface.—Multiply the diameter by the circumference and the product given will give the surface.

To Compute the Total Volume.—Mulitply the cube of the diameter by .5236.

THE CYLINDER

To Compute the Surface.—Multiply the length by the circumference and add the product to the area of the two ends.

CIRCUMFERENCES AND AREAS OF CIRCLES

Diam.	Circum.	Area	Diam.	Circum.	Area	Diam.	Circum.	Area
1/64	.04909	.00019	3	9.4248	7.0686	8	25.133	50.265
1/32	.09818	.00077	1/16	9.6211	7.3662	1/8	25.525	51.849
3/64	.14726	.00173	1/8	9.8175	7.6699	1/4	25.918	53.456
1/16	.19635	.00307	3/16	10.014	7.9798	3/8	26.311	55.088
3/32	.29452	.00690	1/4	10.210	8.2958	1/2	26.704	56.745
1/8	.39270	.01227	5/16	10.407	8.6179	5/8	27.096	58.426
5/32	.49087	.01917	3/8	10.603	8.9462	3/4	27.489	60.132
3/16	.58905	.02761	7/16	10.799	9.2806	7/8	27.882	61.862
7/32	.68722	.03758	1/2	10.996	9.6211	9	28.274	63.617
1/4	.78540	.04909	9/16	11.192	9.9678	1/8	28.667	65.397
9/32	.88357	.06213	5/8	11.388	10.321	1/4	29.060	67.201
5/16	.98175	.07670	11/16	11.585	10.680	3/8	29.452	69.029
11/32	1.0799	.09281	3/4	11.781	11.045	1/2	29.845	70.882
3/8	1.1781	.11045	13/16	11.977	11.416	5/8	30.238	72.760
13/32	1.2763	.12962	7/8	12.174	11.793	3/4	30.631	74.662
7/16	1.3744	.15033	15/16	12.370	12.177	7/8	31.023	76.589
15/32	1.4726	.17257	4	12.566	12.566	10	31.416	78.540
1/2	1.5708	.19635	1/16	12.763	12.962	1/4	32.201	82.516
17/32	1.6690	.22166	1/8	12.959	13.364	1/2	32.987	86.590
9/16	1.7671	.24850	3/16	13.155	13.772	3/4	33.772	90.763
19/32	1.8653	.27688	1/4	13.352	14.186	11	34.558	95.033
5/8	1.9635	.30680	5/16	13.548	14.607	1/4	35.343	99.402
21/32	2.0617	.33824	3/8	13.744	15.033	1/2	36.128	103.87
11/16	2.1598	.37122	7/16	13.941	15.466	3/4	36.914	108.43
23/32	2.2580	.40574	1/2	14.137	15.904	12	37.699	113.10
3/4	2.3562	.44179	9/16	14.334	16.349	1/4	38.485	117.86
25/32	2.4544	.47937	5/8	14.530	16.800	1/2	39.270	122.72
13/16	2.5525	.51849	11/16	14.726	17.257	3/4	40.055	127.68
27/32	2.6507	.55914	3/4	14.923	17.721	13	40.841	132.73
7/8	2.7489	.60132	13/16	15.119	18.190	1/4	41.626	137.89
29/32	2.8471	.64504	7/8	15.315	18.665	1/2	42.412	143.14
15/16	2.9452	.69029	15/16	15.512	19.147	3/4	43.197	148.49
31/32	3.0434	.73708	5	15.708	19.635	14	43.982	153.94
1	3.1416	.7854	1/16	15.904	20.129	1/4	44.768	159.48
1/16	3.3379	.8866	1/8	16.101	20.629	1/2	45.553	165.13
1/8	3.5343	.9940	3/16	16.297	21.135	3/4	46.338	170.87
3/16	3.7306	1.1075	1/4	16.493	21.648	15	47.124	176.71
1/4	3.9270	1.2272	5/16	16.690	22.166	1/4	47.909	182.65
5/16	4.1233	1.3530	3/8	16.886	22.691	1/2	48.695	188.69
3/8	4.3197	1.4849	7/16	17.082	23.221	3/4	49.480	194.83
7/16	4.5160	1.6230	1/2	17.279	23.758	16	50.265	201.06
1/2	4.7124	1.7671	9/16	17.475	24.301	1/4	51.051	207.39
9/16	4.9087	1.9175	5/8	17.671	24.850	1/2	51.836	213.82
5/8	5.1051	2.0739	11/16	17.868	25.406	3/4	52.622	220.35
11/16	5.3014	2.2365	3/4	18.064	25.967	17	53.407	226.98
3/4	5.4978	2.4053	13/16	18.261	26.535	1/4	54.192	233.71
13/16	5.6941	2.5802	7/8	18.457	27.109	1/2	54.978	240.53
7/8	5.8905	2.7612	15/16	18.653	27.688	3/4	55.763	247.45
15/16	6.0868	2.9483	6	18.850	28.274	18	56.549	254.47
2	6.2832	3.1416	1/8	19.242	29.465	1/4	57.334	261.59
1/16	6.4795	3.3410	1/4	19.635	30.680	1/2	58.119	268.80
1/8	6.6759	3.5466	3/8	20.028	31.919	3/4	58.905	276.12
3/16	6.8722	3.7583	1/2	20.420	33.183	19	59.690	283.53
1/4	7.0686	3.9761	5/8	20.813	34.472	1/4	60.476	291.04
5/16	7.2649	4.2000	3/4	21.206	35.785	1/2	61.261	298.65
3/8	7.4613	4.4301	7/8	21.598	37.122	3/4	62.046	306.35
7/16	7.6576	4.6664	7	21.991	38.485	20	62.832	314.16
1/2	7.8540	4.9087	1/8	22.384	39.871	1/4	63.617	322.06
9/16	8.0503	5.1572	1/4	22.776	41.282	1/2	64.403	330.06
5/8	8.2467	5.4119	3/8	23.169	42.718	3/4	65.188	338.16
11/16	8.4430	5.6727	1/2	23.562	44.179	21	65.973	346.36
3/4	8.6394	5.9396	5/8	23.955	45.664	1/4	66.759	354.66
13/16	8.8357	6.2126	3/4	24.347	47.173	1/2	67.544	363.05
7/8	9.0321	6.4918	7/8	24.740	48.707	3/4	68.330	371.54
15/16	9.2284	6.7771						

CIRCUMFERENCES AND AREAS OF CIRCLES—CONTINUED

Diam.	Circum.	Area	Diam.	Circum.	Area	Diam.	Circum.	Area
22	69.115	380.13	36	113.097	1017.9	50	157.080	1963.5
¼	69.900	388.82	¼	113.883	1032.1	51	160.221	2042.8
½	70.686	397.61	½	114.668	1046.3	52	163.363	2123.7
¾	71.471	406.49	¾	115.454	1060.7	53	166.504	2206.2
23	72.257	415.48	37	116.239	1075.2	54	169.646	2290.2
¼	73.042	424.56	¼	117.024	1089.8	55	172.788	2375.8
½	73.827	433.74	½	117.810	1104.5	56	175.929	2463.0
¾	74.613	443.01	¾	118.596	1119.2	57	179.071	2551.8
24	75.398	452.39	38	119.381	1134.1	58	182.212	2642.1
¼	76.184	461.86	¼	120.166	1149.1	59	185.354	2734.0
½	76.969	471.44	½	120.951	1164.2	60	188.496	2827.4
¾	77.754	481.11	¾	121.737	1179.3	61	191.637	2922.5
25	78.540	490.87	39	122.522	1194.6	62	194.779	3019.1
¼	79.325	500.74	¼	123.308	1210.0	63	197.920	3117.2
½	80.111	510.71	½	124.093	1225.4	64	201.062	3217.0
¾	80.896	520.77	¾	124.878	1241.0	65	204.204	3318.3
26	81.681	530.93	40	125.664	1256.6	66	207.345	3421.2
¼	82.467	541.19	¼	126.449	1272.4	67	210.487	3525.7
½	83.252	551.55	½	127.235	1288.2	68	213.628	3631.7
¾	84.038	562.00	¾	128.020	1304.2	69	216.770	3739.3
27	84.823	572.56	41	128.805	1320.3	70	219.911	3848.5
¼	85.608	583.21	¼	129.591	1336.4	71	223.053	3959.2
½	86.394	593.96	½	130.376	1352.7	72	226.195	4071.5
¾	87.179	604.81	¾	131.161	1369.0	73	229.336	4185.4
28	87.965	615.75	42	131.947	1385.4	74	232.478	4300.8
¼	88.750	626.80	¼	132.732	1402.0	75	235.619	4417.9
½	89.535	637.94	½	133.518	1418.6	76	238.761	4536.5
¾	90.321	649.18	¾	134.303	1435.4	77	241.903	4656.6
29	91.106	660.52	43	135.088	1452.2	78	245.044	4778.4
¼	91.892	671.96	¼	135.874	1469.1	79	248.186	4901.7
½	92.677	683.49	½	136.659	1486.2	80	251.327	5026.5
¾	93.462	695.13	¾	137.445	1503.3	81	254.469	5153.0
30	94.248	706.86	44	138.230	1520.5	82	257.611	5281.0
¼	95.033	718.69	¼	139.015	1537.9	83	260.752	5410.6
½	95.819	730.62	½	139.801	1555.3	84	263.894	5541.8
¾	96.604	742.64	¾	140.586	1572.8	85	267.035	5674.5
31	97.389	754.77	45	141.372	1590.4	86	270.177	5808.8
¼	98.175	766.99	¼	142.157	1608.2	87	273.319	5944.7
½	98.960	779.31	½	142.942	1626.0	88	276.460	6082.1
¾	99.746	791.73	¾	143.728	1643.9	89	279.602	6221.1
32	100.531	804.25	46	144.513	1661.9	90	282.743	6361.7
¼	101.316	816.86	¼	145.299	1680.0	91	285.885	6503.9
½	102.102	829.58	½	146.084	1698.2	92	289.027	6647.6
¾	102.887	842.39	¾	146.869	1716.5	93	292.168	6792.9
33	103.673	855.30	47	147.655	1734.9	94	295.310	6939.8
¼	104.458	868.31	¼	148.440	1753.5	95	298.451	7088.2
½	105.243	881.41	½	149.226	1772.1	96	301.593	7238.2
¾	106.029	894.62	¾	150.011	1790.8	97	304.734	7389.8
34	106.814	907.92	48	150.796	1809.6	98	307.876	7543.0
¼	107.600	921.32	¼	151.582	1828.5	99	311.018	7697.7
½	108.385	934.82	½	152.367	1847.5	100	314.159	7854.0
¾	109.170	948.42	¾	153.153	1866.5	101	317.30	8011.85
35	109.956	962.11	49	153.938	1885.7	102	320.44	8171.28
¼	110.741	975.91	¼	154.723	1905.0	103	323.58	8332.29
½	111.527	989.80	½	155.509	1924.4	104	326.73	8494.87
¾	112.312	1003.8	¾	156.294	1943.9	105	329.87	8659.01
						106	333.01	8824.73
						107	336.15	8992.02
						108	339.29	9160.88
						109	342.43	9331.32
						110	345.58	9503.32

BOILER HORSE POWER

The accepted rule for figuring boiler horse power is as follows:

One Horse Power equals the evaporation of 30 lbs. of water per hour from an initial temperature of 100 deg. Fahr. into steam at 70 lbs. gauge pressure, or its equivalent; 34½ lbs. of water evaporated per hour from a temperature of 212 deg. Fahr. into steam at 212 deg.

HORSE POWER OF AN ENGINE

P equals mean effective pressure per square inch of the steam on the piston.
L " length of stroke in feet.
A " area of piston in square inches.
N " number of strokes per minute.

Then Horse Power equals $\frac{PLAN}{33000}$

The approximate mean effective pressure in the cylinder when valve cuts off at:

¼	stroke	equals	steam	pressure	× .597
⅓	"	"	"	"	× .670
⅜	"	"	"	"	× .743
½	"	"	"	"	× .847
⅝	"	"	"	"	× .919
⅔	"	"	"	"	× .937
¾	"	"	"	"	× .966
⅞	"	"	"	"	× .992

RANGES IN STEAM CONSUMPTION BY PRIME MOVERS

(FOR ESTIMATING PURPOSES)

Simple Non-Condensing Engines	29–45	pounds per hour.	
" " " Automatic Engines	26–40	" " "	
" " " Corliss Engines	26–35	" " "	
Compound Non-Condensing Engines	19–28	" " "	
" Condensing Engines	12–22	" " "	
Simple Duplex Steam Pumps	120–200	" " "	
Turbines, Non-Condensing	28–60	"	" K. W. hour
" Condensing	12–42	"	" K. W. hour.

FLOW OF STEAM IN PIPES

To determine the velocity of steam in feet per minute through a pipe, the quantity, pressure and area being known.

V equals velocity in feet per minute.
A " pounds of steam per hour.
B " volume in cubic feet of 1 lb. at given pressure. (See steam tables, pages 683 to 685.)
C " area of pipe in square inches.
1728 " cubic inches in a cubic foot.
60 " minutes in an hour.
12 " inches in a foot.

Then V equals $\frac{A \times B \times 1728}{60 \times C \times 12}$ equals $\frac{A \times B \times 2.4}{C}$

Or A equals $\frac{C \times V}{B \times 2.4}$

Or B equals $\frac{C \times V}{A \times 2.4}$

Or C equals $\frac{A \times B \times 2.4}{V}$

LOSS OF PRESSURE

The above formula does not consider the probable drop, or loss of pressure which is dependent upon the velocity of flow, length of line, number of turns in fittings or valves, and the covering of the pipe. In every steam line there must be a difference in pressure between the inlet and outlet or there could be no flow, and this difference is increased by friction and radiation.

In power plant work a steam velocity of 4,000 to 6,000 feet per minute may be employed without excessive loss, in properly covered pipes 6 inches diameter or larger. For smaller pipe use a lower velocity.

PROPERTIES OF SATURATED STEAM

CONDENSED FROM STEAM TABLES AND DIAGRAMS BY MARKS & DAVIS, WITH THE PERMISSION OF THE PUBLISHERS, MESSRS. LONGMANS, GREEN & CO.

Vacuum, Inches of Mercury	Temperature Fahr.	Total Heat Above 32° Fahr.		Latent Heat of Evaporation	Volume, Cubic Feet in One Pound of Steam	Weight of One Cubic Foot Steam, Pound
		Heat Units in the Water	Heat Units in the Steam			
29.74	32.00	0.00	1073.4	1073.4	3294.0	0.000304
29.18	70.00	38.06	1090.3	1052.3	871.0	0.001148
25.85	126.15	94.0	1115.0	1021.0	173.5	0.00576
15.67	176.85	144.7	1136.5	991.8	53.56	0.01867
9.56	193.22	161.1	1143.1	982.0	38.38	0.02606
5.49	201.96	169.9	1146.5	976.6	32.36	0.03090
Lbs. Gauge						
.0	212.0	180.0	1150.4	970.4	26.79	0.03732
0.3	213.0	181.0	1150.7	969.7	26.27	0.03806
1.3	216.3	184.4	1152.0	967.6	24.79	0.04042
2.3	219.4	187.5	1153.1	965.6	23.38	0.04277
3.3	222.4	190.5	1154.2	963.7	22.16	0.04512
4.3	225.2	193.4	1155.2	961.8	21.07	0.04746
5.3	228.0	196.1	1156.2	960.0	20.08	0.04980
10.3	240.1	208.4	1160.4	952.0	16.30	0.0614
15.3	250.3	218.8	1163.9	945.1	13.74	0.0728
20.3	259.3	227.9	1166.8	938.9	11.89	0.0841
25.3	267.3	236.1	1169.4	933.3	10.49	0.0953
30.3	274.5	243.4	1171.6	928.2	9.39	0.1065
35.3	281.0	250.1	1173.6	923.5	8.51	0.1175
40.3	287.1	256.3	1175.4	919.0	7.78	0.1285
45.3	292.7	262.1	1177.0	914.9	7.17	0.1394
50.3	298.0	267.5	1178.5	911.0	6.65	0.1503
55.3	302.9	272.6	1179.8	907.2	6.20	0.1612
60.3	307.6	277.4	1181.1	903.7	5.81	0.1721
65.3	312.0	282.0	1182.3	900.3	5.47	0.1829
70.3	316.3	286.3	1183.4	897.1	5.16	0.1937
75.3	320.3	290.5	1184.4	893.9	4.89	0.2044

(CONTINUED)

PROPERTIES OF SATURATED STEAM

CONDENSED FROM STEAM TABLES AND DIAGRAMS BY MARKS & DAVIS, WITH THE PERMISSION OF THE PUBLISHERS, MESSRS. LONGMANS, GREEN & CO.

Gauge Pressure, Pounds per Square Inch	Temperature, Fahr.	Total Heat Above 32° Fahr.		Latent Heat of Evaporation	Volume Cubic Feet in One Pound of Steam	Weight of One Cubic Foot Steam, Pounds
		Heat Units in the Water	Heat Units in the Steam			
80.3	324.1	294.5	1185.4	890.9	4.65	0.2151
85.3	327.8	298.3	1186.3	888.0	4.429	0.2258
90.3	331.4	302.0	1187.2	885.2	4.230	0.2365
95.3	334.8	305 5	1188.0	882.5	4.047	0.2472
100.3	338.1	309.0	1188.8	879.8	3.880	0.2577
105.3	341.3	312.3	1189.6	877.2	3.726	0.2683
110.3	344.4	315.5	1190.3	874.7	3.583	0.2791
115.3	347.4	318.6	1191.0	872.3	3.452	0.2897
120.3	350.3	321.7	1191.6	869.9	3.331	0.3002
125.3	353.1	324.6	1192.2	867.6	3.219	0.3107
130.3	355.8	327.4	1192.8	865.4	3.112	0.3213
135.3	358.5	330.2	1193.4	863.2	3.012	0.3320
140.3	361.0	332.9	1194.0	861.0	2.920	0.3425
145.3	363.6	335.6	1194.5	858.8	2.834	0.3529
150.3	366.0	338.2	1195.0	856.8	2.753	0.3633
155.3	368.5	340.7	1195.4	854.7	2.675	0.3738
160.3	370.8	343.2	1195.9	852.7	2.602	0.3843
165.3	373.1	345.6	1196.4	850.8	2.533	0.3948
170.3	375.4	348.0	1196.8	848.8	2.468	0.4052
175.3	377.6	350.4	1197.3	846.9	2.406	0.4157
180.3	379.8	352.7	1197.7	845.0	2.346	0.4262
185.3	381.9	354.9	1198.1	843.2	2.290	0.437
190.3	384.0	357.1	1198.5	841.4	2.237	0.447
195.3	386.0	359.2	1198.8	839.6	2.187	0.457
200.3	388.0	361.4	1199.2	837.9	2.138	0.468
225.3	397.4	371.4	1200.9	829.5	1.924	0.520
250.3	406.2	380.7	1202.3	821.6	1.750	0.571
275.3	414.4	389.4	1203.6	814.2	1.602	0.624
300.3	421.9	397.5	1204.7	807.2	1.479	0.676

PROPERTIES OF SATURATED STEAM

CONDENSED FROM STEAM TABLES AND DIAGRAMS
BY MARKS & DAVIS, WITH THE PERMISSION OF THE
PUBLISHERS, MESSRS. LONGMANS, GREEN & CO.

Gauge Pressure Pounds Per Square Inch	Temperature Fahr.	Total Heat Above 32° Fahr.		Latent Heat of Evaporation	Volume Cubic Feet in One Pound of Steam	Weight of One Cubic Foot Steam Pounds
		Heat Units in the Water	Heat Units in the Steam			
305.3	423.4	399.1	1204.9	805.8	1.456	0.687
315.3	426.3	402.2	1205.3	803.1	1.413	0.708
325.3	429.1	405.3	1205.7	800.4	1.372	0.729
335.3	431.9	408.2	1206.1	797.8	1.334	0.750
345.3	434.6	411.2	1206.4	795.3	1.298	0.770
355.3	437.2	414.0	1206.8	792.8	1.264	0.791
365.3	439.8	416.8	1207.1	790.3	1.231	0.812
375.3	442.3	419.5	1207.4	787.9	1.200	0.833
385.3	444.8	422	1208	786	1.17	0.86
400.3	448.5	427.5	1208.5	780	1.10	0.90
435.3	456.5	435	1209	774	1.04	0.96
485.3	467.3	448	1210	762	0.93	1.08
535.3	477.3	459	1210	751	0.83	1.20
585.3	486.6	469	1210	741	0.76	1.32
650.3	497.5	482	1211	729	0.70	1.43
700.3	505.5	491	1211	720	0.65	1.54
750.3	513.5	500	1211	711	0.61	1.64
800.3	521.0	508	1210	702	0.57	1.75
850.3	527.8	516	1209	693	0.53	1.89
900.3	534.4	524	1209	685	0.50	2.00
950.3	540.7	531	1208	677	0.48	2.08
1000.3	546.7	538	1206	668	0.45	2.22
1050.3	552.5	545	1205	660	0.43	2.33
1100.3	558.3	552	1204	652	0.41	2.44
1150.3	563.7	558	1203	645	0.39	2.57
1200.3	569.3	565	1201	636	0.37	2.71

PROPERTIES OF AMMONIA

BUREAU OF STANDARD TABLES

Temperature, Degrees Fahr.	Pressure, lbs. per Sq. Inch Absolute	Specific Vol. Cu. Ft. per Lb.		Total Heat of Liquid	Latent Heat of Evaporation	Total Heat of Vapor	Entropy		
		Liquid	Vapor				Liquid	Evap.	Vapor
—40	10.41	.02322	24.84	0.0	597.0	597.0	.000	1.423	1.423
—35	12.05	.02333	21.66	5.3	593.6	598.9	.013	1.398	1.411
—30	13.91	.02345	18.96	10.7	590.2	600.9	.025	1.374	1.399
—25	15.98	.02357	16.64	16.0	586.8	602.8	.037	1.350	1.387
—20	18.30	.02369	14.67	21.4	583.3	604.7	.050	1.327	1.377
—15	20.88	.02381	12.97	26.7	579.7	606.4	.062	1.304	1.366
—10	23.75	.02393	11.50	32.1	576.1	608.2	.074	1.281	1.355
—5	26.92	.02406	10.22	37.5	572.4	609.9	.086	1.259	1.345
0	30.42	.02419	9.114	42.9	568.7	611.6	.097	1.237	1.334
5	34.28	.02432	8.149	48.3	564.9	613.2	.109	1.216	1.325
10	38.51	.02446	7.304	53.8	561.0	614.8	.121	1.195	1.316
15	43.15	.02460	6.562	59.2	557.1	616.3	.132	1.174	1.306
20	48.21	.02474	5.910	64.7	553.1	617.8	.144	1.153	1.297
25	53.73	.02488	5.336	70.2	549.1	619.3	.155	1.133	1.288
30	59.74	.02503	4.827	75.7	544.9	620.6	.166	1.113	1.279
35	66.26	.02518	4.375	81.2	540.7	621.9	.177	1.093	1.270
40	73.32	.02533	3.974	86.8	536.5	623.3	.189	1.074	1.263
45	80.95	.02548	3.616	92.3	532.1	624.4	.200	1.054	1.254
50	89.19	.02564	3.296	97.9	527.7	625.6	.211	1.036	1.247
55	98.05	.02581	3.010	103.5	523.1	626.6	.221	1.017	1.238
60	107.6	.02597	2.754	109.2	518.5	627.7	.232	0.998	1.230
65	117.8	.02614	2.522	114.8	513.7	628.5	.243	.979	1.222
70	128.8	.02632	2.314	120.5	508.9	629.4	.254	.961	1.215
75	140.5	.02650	2.126	126.2	504.1	630.3	.264	.943	1.207
80	153.1	.02668	1.956	132.0	499.1	631.1	.275	.925	1.200
85	166.4	.02687	1.803	137.7	494.0	631.7	.285	.907	1.192
90	180.7	.02707	1.663	143.5	488.8	632.3	.296	.889	1.185
95	195.8	.02727	1.536	149.3	483.5	632.8	.306	.872	1.178
100	211.9	.02747	1.419	155.2	478.0	633.2	.316	.854	1.170
105	228.9	.02769	1.314	161.1	472.5	633.6	.327	.837	1.164
110	247.0	.02790	1.217	167.0	466.7	633.7	.337	.819	1.156
115	266.1	.02813	1.129	173.0	460.9	633.9	.347	.802	1.149
120	286.4	.02836	1.048	179.0	454.9	633.9	.358	.785	1.143

STRENGTH OF BOLTS

Diameter of Bolts	Number of Threads per Inch	Areas		Tensile Stress			Shearing Stress			
							Full Bolt		Bottom of Thread	
		Full Bolt	Bottom of Threads	10,000 Lbs. per Sq. Inch	12,500 Lbs. per Sq. Inch	17,500 Lbs. per Sq. Inch	7,500 Lbs. per Sq. Inch	10,000 Lbs. per Sq. Inch	7,500 Lbs. per Sq. Inch	10,000 Lbs. per Sq. Inch
Inches		Sq. Inches	Sq. Inches	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
1/4	20	.049	.027	270	340	470	370	490	200	270
5/16	18	.077	.045	450	570	790	580	770	340	450
3/8	16	.110	.068	680	850	1,190	830	1,100	510	680
7/16	14	.150	.093	930	1,170	1,630	1,130	1,500	700	930
1/2	13	.196	.126	1,260	1,570	2,200	1,470	1,960	945	1,260
9/16	12	.249	.162	1,620	2,030	2,840	1,860	2,480	1,220	1,620
5/8	11	.307	.202	2,020	2,520	3,530	2,300	3,070	1,510	2,020
3/4	10	.442	.302	3,020	3,770	5,290	3,310	4,420	2,270	3,020
7/8	9	.601	.419	4,190	5,240	7,340	4,510	6,010	3,150	4,190
1	8	.785	.551	5,510	6,890	9,640	5,890	7,850	4,130	5,510
1 1/8	7	.994	.693	6,930	8,660	12,130	7,450	9,940	5,200	6,930
1 1/4	7	1.227	.890	8,900	11,120	15,570	9,200	12,270	6,670	8,900
1 3/8	6	1.485	1.054	10,540	13,180	18,450	11,140	14,850	7,910	10,540
1 1/2	6	1.767	1.294	12,940	16,170	22,640	13,250	17,670	9,700	12,940
1 5/8	5 1/2	2.074	1.515	15,150	18,940	26,510	15,550	20,740	11,360	15,150
1 3/4	5	2.405	1.745	17,450	21,800	30,520	18,040	24,050	13,080	17,440
1 7/8	5	2.761	2.049	20,490	25,610	35,860	20,710	27,610	15,370	20,490
2	4 1/2	3.142	2.300	23,000	28,750	40,250	23,560	31,420	17,250	23,000
2 1/4	4 1/2	3.976	3.021	30,210	37,770	52,870	29,820	39,760	22,660	30,210
2 1/2	4	4.909	3.716	37,160	46,450	65,040	36,820	49,090	27,870	37,160

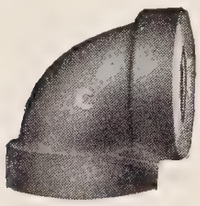
LIST OF SIZES

STANDARD CAST IRON FITTINGS

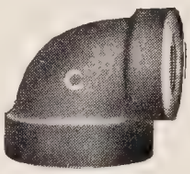
In arranging the order of Cast Iron Fittings we will use the following rule: For example, it is well known the largest opening, either in the run or branch determines the size of the fitting. A ¾x¾x1¼ Tee will, therefore, be found amongst the 1¼ inch fittings. Of course, these remarks apply to all sizes and combinations.

In describing Fittings, the run is first named, then the outlet.

ELBOWS



ELBOW



REDUCING ELBOW

45° ELBOW

Size	Size	Size
* ¼x ¼	*2 x2	4 x2½
* ⅜x ⅜	*2 x1½	4 x2
⅜x ¼	*2 x1¼	* 4½x 4½
* ½x ½	*2 x1	4½x 4
* ½x ⅜	*2 x ¾	* 5 x 5
½x ¼	*2½x2½	5 x 4½
* ¾x ¾	*2½x2	5 x 4
* ¾x ½	2½x1½	5 x 3
¾x ⅜	2½x1¼	5 x 2½
*1 x1	2½x1	* 6 x 6
*1 x ¾	*3 x3	6 x 5
1 x ½	3 x2½	6 x 4
1 x ⅜	*3 x2	* 7 x 7
*1¼x1¼	3 x1½	7 x 6
1¼x1	3 x1¼	* 8 x 8
1¼x ¾	*3½x3½	8 x 7
1¼x ½	3½x3	8 x 6
1¼x ⅜	3½x2½	* 9 x 9
*1½x1½	3½x2	*10 x10
*1½x1¼	*4 x4	10 x 8
1½x1	4 x3½	*12 x12
1½x ¾	*4 x3	

45° ELBOWS

Size, Inches	*¼	*⅜	*½	*¾	*1	*1¼	*1½	*2	*2½	*3
Size, Inches	*3½	*4	*4½	*5	*6	*7	*8	*9	*10	*12

60° AND 22½° ELBOWS

Size, Inches	½	¾	1	1¼	1½	2	2½	3	4	5	6

PITCHED ELBOWS

Size, Inches	½	¾x½	¾	1x¾	1	1¼x1	1¼	1½x1	1½x1¼	1½
Size, Inches	2x1½	2	2½x2	2½	3x2½	3	3½x3	3½	4	

RIGHT AND LEFT ELBOWS

Size, Inches	¼	⅜	½	¾	1	1¼	1½	2	2½	3

Such sizes as are marked with an * are carried in stock Galvanized.

FOR GENERAL DIMENSIONS, SEE PAGE 643

LIST OF SIZES

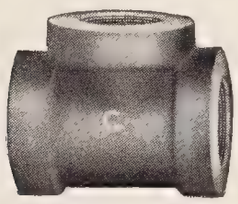
STANDARD CAST IRON FITTINGS

TEES

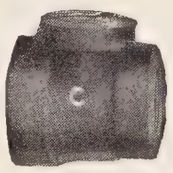
In describing Tees, the run is first named, then the outlet, thus:

$\frac{1}{2}$ T $\frac{1}{2}=\frac{1}{2}x\frac{3}{4}$ — $\frac{1}{2}$ T $\frac{3}{8}=\frac{1}{2}x\frac{3}{8}x\frac{3}{4}$

$\frac{3}{4}$ — $\frac{3}{4}$



TEE



REDUCING TEE

Size	Size	Size	Size
* $\frac{1}{4}$x $\frac{1}{4}$x $\frac{1}{4}$	*1 x $\frac{3}{4}$x1	*1 x1 x1$\frac{1}{4}$	1$\frac{1}{4}$x $\frac{1}{2}$x1$\frac{1}{2}$
	*1 x $\frac{3}{4}$x $\frac{3}{4}$	1 x $\frac{3}{4}$x1$\frac{1}{4}$	*1 x1 x1$\frac{1}{2}$
* $\frac{3}{8}$x $\frac{3}{8}$x $\frac{3}{8}$	*1 x $\frac{3}{4}$x $\frac{1}{2}$	$\frac{3}{4}$x $\frac{3}{4}$x1$\frac{1}{4}$	1 x $\frac{3}{4}$x1$\frac{1}{2}$
* $\frac{3}{8}$x $\frac{3}{8}$x $\frac{1}{4}$	1 x $\frac{1}{2}$x1	*1$\frac{1}{2}$x1$\frac{1}{2}$x1$\frac{1}{2}$	$\frac{3}{4}$x $\frac{3}{4}$x1$\frac{1}{2}$
	*1 x $\frac{1}{2}$x $\frac{3}{4}$	*1$\frac{1}{2}$x1$\frac{1}{2}$x1$\frac{1}{4}$	
* $\frac{1}{2}$x $\frac{1}{2}$x $\frac{1}{2}$	1 x $\frac{1}{2}$x $\frac{1}{2}$	*1$\frac{1}{2}$x1$\frac{1}{2}$x1	*2 x2 x2
* $\frac{1}{2}$x $\frac{1}{2}$x $\frac{3}{8}$	1 x $\frac{3}{8}$x1	*1$\frac{1}{2}$x1$\frac{1}{2}$x $\frac{3}{4}$	*2 x2 x1$\frac{1}{2}$
* $\frac{1}{2}$x $\frac{1}{2}$x $\frac{1}{4}$	1 x $\frac{1}{4}$x1	*1$\frac{1}{2}$x1$\frac{1}{2}$x $\frac{1}{2}$	*2 x2 x1$\frac{1}{4}$
$\frac{1}{2}$x $\frac{3}{8}$x $\frac{1}{2}$	* $\frac{3}{4}$x $\frac{3}{4}$x1	*1$\frac{1}{2}$x1$\frac{1}{4}$x1$\frac{1}{2}$	*2 x2 x1
$\frac{1}{2}$x $\frac{3}{8}$x $\frac{3}{8}$	$\frac{3}{4}$x $\frac{1}{2}$x1	*1$\frac{1}{2}$x1$\frac{1}{4}$x1$\frac{1}{4}$	*2 x2 x $\frac{3}{4}$
$\frac{3}{8}$x $\frac{3}{8}$x $\frac{1}{2}$	$\frac{1}{2}$x $\frac{1}{2}$x1	*1$\frac{1}{2}$x1$\frac{1}{4}$x1	*2 x2 x $\frac{1}{2}$
		*1$\frac{1}{2}$x1$\frac{1}{4}$x $\frac{3}{4}$	*2 x2 x $\frac{1}{4}$
* $\frac{3}{4}$x $\frac{3}{4}$x $\frac{3}{4}$	*1$\frac{1}{4}$x1$\frac{1}{4}$x1$\frac{1}{4}$	*1$\frac{1}{2}$x1$\frac{1}{4}$x $\frac{1}{2}$	*2 x1$\frac{1}{2}$x2
* $\frac{3}{4}$x $\frac{3}{4}$x $\frac{1}{2}$	*1$\frac{1}{4}$x1$\frac{1}{4}$x1	1$\frac{1}{2}$x1 x1$\frac{1}{2}$	*2 x1$\frac{1}{2}$x1$\frac{1}{2}$
* $\frac{3}{4}$x $\frac{3}{4}$x $\frac{3}{8}$	*1$\frac{1}{4}$x1$\frac{1}{4}$x $\frac{3}{4}$	1$\frac{1}{2}$x1 x1$\frac{1}{4}$	*2 x1$\frac{1}{2}$x1$\frac{1}{4}$
* $\frac{3}{4}$x $\frac{3}{4}$x $\frac{1}{4}$	*1$\frac{1}{4}$x1$\frac{1}{4}$x $\frac{1}{2}$	1$\frac{1}{2}$x1 x1	*2 x1$\frac{1}{2}$x1
* $\frac{3}{4}$x $\frac{1}{2}$x $\frac{3}{4}$	*1$\frac{1}{4}$x1$\frac{1}{4}$x $\frac{3}{8}$	1$\frac{1}{2}$x1 x $\frac{3}{4}$	*2 x1$\frac{1}{2}$x $\frac{3}{4}$
* $\frac{3}{4}$x $\frac{1}{2}$x $\frac{1}{2}$	*1$\frac{1}{4}$x1$\frac{1}{4}$x $\frac{1}{4}$	1$\frac{1}{2}$x1 x $\frac{1}{2}$	2 x1$\frac{1}{2}$x $\frac{1}{2}$
$\frac{3}{4}$x $\frac{3}{8}$x $\frac{3}{4}$	1$\frac{1}{4}$x1 x1$\frac{1}{4}$	1$\frac{1}{2}$x $\frac{3}{4}$x 1$\frac{1}{2}$	*2 x1$\frac{1}{4}$x2
$\frac{3}{4}$x $\frac{3}{8}$x $\frac{3}{8}$	*1$\frac{1}{4}$x1 x1	1$\frac{1}{2}$x $\frac{3}{4}$x1$\frac{1}{4}$	2 x1$\frac{1}{4}$x1$\frac{1}{2}$
$\frac{3}{4}$x $\frac{1}{4}$x $\frac{3}{4}$	*1$\frac{1}{4}$x1 x $\frac{3}{4}$	1$\frac{1}{2}$x $\frac{3}{4}$x1	*2 x1$\frac{1}{4}$x1$\frac{1}{4}$
* $\frac{1}{2}$x $\frac{1}{2}$x $\frac{3}{4}$	*1$\frac{1}{4}$x1 x $\frac{1}{2}$	1$\frac{1}{2}$x $\frac{3}{4}$x $\frac{3}{4}$	2 x1$\frac{1}{4}$x1
	*1$\frac{1}{4}$x $\frac{3}{4}$x1$\frac{1}{4}$	1$\frac{1}{2}$x $\frac{1}{2}$x1$\frac{1}{2}$	2 x1$\frac{1}{4}$x $\frac{3}{4}$
*1 x1 x1	1$\frac{1}{4}$x $\frac{3}{4}$x1	1$\frac{1}{2}$x $\frac{1}{2}$x1$\frac{1}{4}$	*2 x1 x2
*1 x1 x $\frac{3}{4}$	1$\frac{1}{4}$x $\frac{3}{4}$x $\frac{3}{4}$	1$\frac{1}{2}$x $\frac{3}{8}$x1$\frac{1}{2}$	2 x1 x1$\frac{1}{2}$
*1 x1 x $\frac{1}{2}$	*1$\frac{1}{4}$x $\frac{1}{2}$x1$\frac{1}{4}$	*1$\frac{1}{4}$x1$\frac{1}{4}$x1$\frac{1}{2}$	2 x1 x1$\frac{1}{4}$
*1 x1 x $\frac{3}{8}$	1$\frac{1}{4}$x $\frac{1}{4}$x1$\frac{1}{4}$	1$\frac{1}{4}$x1 x1$\frac{1}{2}$	2 x1 x1
*1 x1 x $\frac{1}{4}$	1$\frac{1}{4}$x $\frac{1}{2}$x1	1$\frac{1}{4}$x $\frac{3}{4}$x1$\frac{1}{2}$	2 x1 x $\frac{3}{4}$

Such sizes as are marked with an * are carried in stock Galvanized.

FOR GENERAL DIMENSIONS, SEE PAGE 643

LIST OF SIZES

STANDARD CAST IRON FITTINGS

TEES

CONTINUED

Size	Size	Size	Size
2 x ¾x2	2½x1¼x1½	3 x1½x2	*4 x4 x3
2 x ¾x1½	2½x1 x2½	3 x1¼x3	*4 x4 x2½
2 x ½x1½	2½x1 x2	3 x1 x3	*4 x4 x2
2 x ¼x2	2½x ¾x2½	2½x2½x3	*4 x4 x1½
2 x ½x2	2½x ½x2½	2½x2 x3	*4 x4 x1¼
*1½x1½x2	*2 x2 x2½	2½x1½x3	*4 x4 x1
1½x1¼x2	2 x1½x2½	*2 x2 x3	*4 x4 x ¾
1½x1 x2	2 x1¼x2½		4 x3½x4
1½x ¾x2	2 x1 x2½		4 x3½x3½
1¼x1¼x2	2 x ¾x2½	*3½x3½x3½	4 x3½x3
1¼x1 x2	1½x1½x2½	*3½x3½x3	4 x3½x2½
1¼x ¾x2	1½x1¼x2½	*3½x3½x2½	4 x3½x2
1 x1 x2	1½x1 x2½	*3½x3½x2	4 x3½x1½
1 x ¾x2		*3½x3½x1½	4 x3½x1¼
¾x ¾x2	*3 x3 x3	*3½x3½x1¼	4 x3½x1
	*3 x3 x2½	*3½x3½x1	4 x3 x4
*2½x2½x2½	*3 x3 x2	*3½x3½x ¾	4 x3 x3½
*2½x2½x2	*3 x3 x1½	3½x3 x3½	*4 x3 x3
*2½x2½x1½	*3 x3 x1¼	3½x3 x3	*4 x3 x2½
*2½x2½x1¼	*3 x3 x1	3½x3 x2½	*4 x3 x2
*2½x2½x1	*3 x3 x¾	3½x3 x2	4 x3 x1½
*2½x2½x ¾	*3 x3 x½	3½x3 x1½	4 x3 x1¼
*2½x2½x ½	3 x2½x3	3½x3 x1¼	4 x3 x1
2½x2 x2½	*3 x2½x2½	3½x3 x1	4 x3 x ¾
*2½x2 x2	*3 x2½x2	3½x3 x ¾	4 x2½x4
*2½x2 x1½	*3 x2½x1½	3½x2½x3½	4 x2½x3½
*2½x2 x1¼	*3 x2½x1¼	3½x2½x3	4 x2½x3
*2½x2 x1	3 x2½x1	3½x2½x2½	4 x2½x2½
2½x2 x ¾	3 x2½x ¾	3½x2½x2	4 x2½x2 .
2½x2 x ½	*3 x2 x3	3½x2 x3½	4 x2½x1½
2½x1½x2½	3 x2 x2½	3½x1½x3½	4 x2½x1¼
2½x1½x2	*3 x2 x2	3½x1¼x3½	4 x2½x1
2½x1½x1½	3 x2 x1½	3½x1 x3½	*4 x2 x4
2½x1½x1¼	3 x2 x1¼	3 x3 x3½	4 x2 x3
2½x1½x1	3 x2 x1		4 x2 x2½
2½x1¼x2½	3 x1½x3	*4 x4 x4	4 x2 x2
*2½x1¼x2	3 x1½x2½	*4 x4 x3½	

Such sizes as are marked with an * are carried in stock Galvanized.

FOR GENERAL DIMENSIONS, SEE PAGE 643

LIST OF SIZES

STANDARD CAST IRON FITTINGS

TEES

CONTINUED

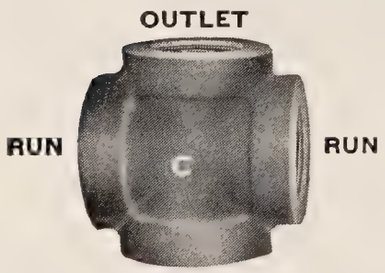
Size	Size	Size	Size
4 x1½x4	5 x4 x2	6 x4 x3	8x 7x 8
4 x1¼x4	5 x4 x1½	6 x3 x6	8x 7x 6
4 x1 x4	5 x3½x3½	6 x2½x6	8x 7x 5
3½x3½x4	5 x3 x5	6 x2 x6	8x 7x 4
3 x3 x4	5 x3 x4½	5 x5 x6	8x 7x 3
*2½x2½x4	5 x3 x4	5 x3½x6	8x 6x 8
2 x2 x4	5 x3 x3½	4 x4 x6	8x 6x 7
	5 x3 x3		8x 6x 6
*4½x4½x4½	5 x3 x2½	*7 x7 x7	8x 5x 8
*4½x4½x4	5 x3 x2	7 x7 x6	8x 5x 5
*4½x4½x3½	5 x2½x5	7 x7 x5	8x 4x 8
*4½x4½x3	5 x2½x4	7 x7 x4	8x 4x 6
*4½x4½x2½	5 x2½x3	7 x7 x3½	6x 6x 8
*4½x4½x2	5 x2 x5	7 x7 x3	
*4½x4½x1½	5 x1½x5	7 x7 x2½	* 9x 9x 9
*4½x4½x1¼	5 x1¼x5	7 x7 x2	9x 9x 7
*4½x4½x1	*4 x4 x5	7 x6 x7	9x 9x 6
4½x4 x3	*6 x6 x6	7 x6 x6	9x 9x 5
4½x4 x2	*6 x6 x5	7 x6 x5	
	*6 x6 x4½	7 x6 x4	*10x10x10
*5 x5 x5	*6 x6 x4	7 x6 x3	10x10x 8
*5 x5 x4½	*6 x6 x3½	7 x5 x6	10x10x 6
*5 x5 x4	*6 x6 x3	7 x5 x5	10x10x 5
*5 x5 x3½	*6 x6 x2½	6 x6 x7	10x10x 4
*5 x5 x3	*6 x6 x2	5 x5 x7	10x10x 3
*5 x5 x2½	*6 x6 x1½		10x10x 2
*5 x5 x2	*6 x6 x1¼	*8 x8 x8	10x 8x 8
*5 x5 x1½	*6 x6 x1	8 x8 x7	8x 8x10
*5 x5 x1¼	6 x5 x6	8 x8 x6	
*5 x5 x1	6 x5 x5	8 x8 x5	*12x12x12
*5 x5 x ¾	6 x5 x4	8 x8 x4	12x12x10
5 x4 x5	6 x5 x3½	8 x8 x3½	12x12x 8
5 x4 x4½	6 x5 x3	8 x8 x3	12x12x 6
*5 x4 x4	6 x5 x2½	8 x8 x2½	12x12x 5
5 x4 x3½	6 x5 x2	8 x8 x2	12x12x 4
5 x4 x3	6 x5 x1½	8 x8 x1½	12x 8x 10
5 x4 x2½	6 x4 x6	8 x8 x1¼	12x 8x 8
	6 x4 x4		

Such sizes as are marked with an * are carried in stock Galvanized.

FOR GENERAL DIMENSIONS, SEE PAGE 643.

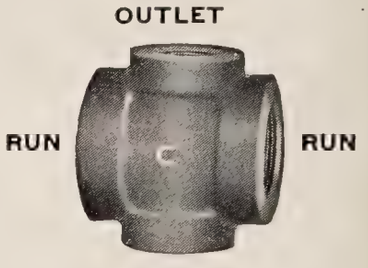
LIST OF SIZES

STANDARD CAST IRON FITTINGS



OUTLET CROSS

CROSSES



OUTLET REDUCING CROSS

Note.—In describing crosses, the run openings are first named and then the outlets.

Size	Size	Size
* ½x ½x ½x ½	2 x2 x1 x1	2½x2 x1 x ¾
	2 x2 x1 x ¾	2½x2 x ¾x ¾
* ¾x ¾x ¾x ¾	2 x2 x ¾x ¾	2½x1½x2 x1½
¾x ¾x ½x ½	2 x2 x ½x ½	2½x1½x1½x1
¾x ½x ½x ½	2 x1½x1½x1½	2½x1½x1¼x1¼
	2 x1½x1¼x1¼	
*1 x1 x1 x1	2 x1½x1¼x1	*3 x3 x3 x3
1 x1 x ¾x ¾	2 x1½x1 x1	3 x3 x2½x2½
1 x1 x ½x ½	2 x1½x1 x ¾	3 x3 x2 x2
1 x ¾x ¾x ¾	2 x1½x ¾x ¾	3 x3 x2 x1½
	2 x1¼x1 x ¾	3 x3 x2 x1
*1¼x1¼x1¼x1¼	2 x1 x1½x1	3 x3 x1½x1½
1¼x1¼x1 x1		3 x3 x1½x1¼
1¼x1¼x ¾x ¾	*2½x2½x2½x2½	3 x3 x1½x1
1¼x1¼x ½x ½	2½x2½x2 x2	3 x3 x1½x ¾
1¼x1 x1 x1	2½x2½x1½x1½	3 x3 x1¼x1¼
1¼x1 x ¾x ¾	2½x2½x1½x1¼	3 x3 x1¼x1
1¼x ¾x ¾x ¾	2½x2½x1½x1	3 x3 x1¼x ¾
	2½x2½x1¼x1¼	3 x3 x1 x1
*1½x1½x1½x1½	2½x2½x1¼x1	3 x3 x ¾x ¾
1½x1½x1¼x1¼	2½x2½x1¼x ¾	3 x2½x2½x2
1½x1½x1 x1	2½x2½x1 x1	3 x2½x2½x1½
1½x1½x ¾x ¾	2½x2½x1 x ¾	3 x2½x2 x2
1½x1½x ½x ½	2½x2½x ¾x ¾	3 x2½x2 x1½
1½x1¼x1¼x1¼	2½x2 x2 x1½	3 x2½x2 x1¼
1½x1¼x1 x1	2½x2 x2 x1¼	3 x2½x2 x1
1½x1¼x ¾x ¾	2½x2 x2 x1	3 x2½x2 x ¾
1½x1 x1 x ¾	2½x2 x1½x1½	3 x2½x1½x1½
1½x1 x1 x ½	2½x2 x1½x1¼	3 x2½x1½x1¼
1½x1 x ¾x ¾	2½x2 x1½x1	3 x2½x1½x1
*2 x2 x2 x2	2½x2 x1½x ¾	3 x2½x1¼x1¼
2 x2 x1½x1½	2½x2 x1¼x1¼	3 x2½x1¼x1
2 x2 x1¼x1¼	2½x2 x1¼x1	3 x2½x1 x1
2 x2 x1¼x1	2½x2 x1 x1	3 x2 x2 x2

Such sizes as are marked with an * are carried in stock Galvanized.

FOR GENERAL DIMENSIONS, SEE PAGE 643

LIST OF SIZES

STANDARD CAST IRON FITTINGS

CROSSES

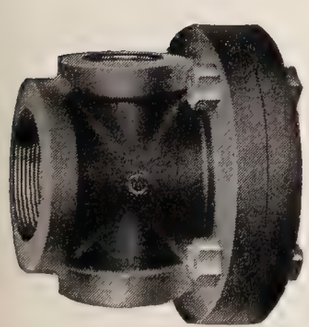
CONTINUED

Size	Size	Size
*3½x3½x3½x3½	4 x4 x1¼x1¼	*6 x6 x6 x6
3½x3½x3 x3	4 x4 x1¼x1	6 x6 x5 x5
3½x3½x2½x2½	4 x4 x1 x1	6 x6 x4 x4
3½x3½x2 x2	4 x3½x2½x2	6 x6 x3 x3
3½x3½x2 x1½	4 x3½x2 x2	6 x6 x2½x2½
3½x3½x1½x1½	4 x3½x2 x1½	6 x6 x2 x2
3½x3½x1½x1¼	4 x3½x2 x1¼	6 x6 x2 x1½
3½x3½x1½x1	4 x3½x1½x1½	6 x6 x1½x1½
3½x3½x1¼x1¼	4 x3½x1½x1¼	6 x5 x2 x2
3½x3½x1¼x1	4 x3½x1¼x1¼	6 x5 x2 x1½
3½x3½x1 x1	4 x3½x1¼x1	6 x5 x1½x1½
3½x3 x2½x2		
3½x3 x2 x2	*4½x4½x4½x4½	*7 x7 x7 x7
3½x3 x2 x1½		7 x7 x6 x6
3½x3 x2 x1¼	*5 x5 x5 x5	7 x7 x5 x5
3½x3 x1½x1½	5 x5 x4 x4	
3½x3 x1½x1¼	5 x5 x3 x3	*8 x8 x8 x8
3½x3 x1½x1	5 x5 x2½x2½	8 x8 x7 x7
3½x3 x1¼x1¼	5 x5 x2 x2	8 x8 x6 x6
3½x3 x1¼x1	5 x5 x2 x1½	8 x8 x5 x5
3½x3 x1 x1	5 x5 x1½x1½	8 x8 x4 x4
	5 x5 x1½x1¼	
*4 x4 x4 x4	5 x5 x1 x1	*9 x9 x9 x9
4 x4 x3½x3½	5 x4 x2 x2	
4 x4 x3 x3	5 x4 x2 x1½	*10x10x10x10
4 x4 x2½x2½	5 x4 x1½x1½	10x10x 8x 8
4 x4 x2 x2	5 x4 x1½x1¼	10x10x 7x 7
4 x4 x2 x1½	5 x4 x1¼x1	
4 x4 x1½x1½	5 x4 x1 x1	*12x12x12x12
4 x4 x1½x1¼		12x12x10x10
4 x4 x1½x1		12x12x 8x 8

Such sizes as are marked with an * are carried in stock Galvanized.

FOR GENERAL DIMENSIONS, SEE PAGE 643

STANDARD BLOW-OFF CROSSES



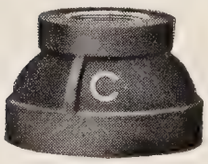
Size	Size
2½x1½	4x2½
2½x2	5x2½
2½x2½	5x3
3 x1½	6x2½
3 x2	6x3
4 x2	

Other sizes made to order.

LIST OF SIZES

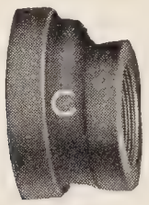
STANDARD CAST IRON FITTINGS

REDUCERS



Size	Size	Size
4½x4	6 x5	8x 7
5 x4½	6 x4	8x 6
5 x4	6 x3½	8x 4
5 x3½	6 x3	10x 8
5 x3	6 x2½	10x 6
5 x2½	6 x2	12x10
5 x2	7 x6	

ECCENTRIC REDUCERS



Size	Size	Size
1¼x ¾	3 x2½	5 x3
1¼x1	3½x1¼	5 x3½
1½x1	3½x1½	5 x4
1½x1¼	3½x2	5 x4½
2 x ¾	3½x2½	6 x2½
2 x1	3½x3	6 x3
2 x1¼	4 x2	6 x3½
2 x1½	4 x2½	6 x4
2½x1¼	4 x3	6 x5
2½x1½	4 x3½	7 x6
2½x2	4½x4	8 x5
3 x1½	5 x2	8 x6
3 x2	5 x2½	8 x7

Y BENDS

Size	Size	Size
½	2½	6
¾	3	7
1	3½	8
1¼	4	10
1½	4½	12
2	5	

CAPS

Size	Size	Size
*4	*6	*9
*4½	*7	*10
*5	*8	*12

PLUGS

Square Head

* ⅛	* 4
* ¼	* 4½
* ⅜	* 5
* ½	* 6
* ¾	* 7
*1	* 8
*1¼	* 9
*1½	*10
*2	*12
*2½	
*3	
*3½	

Solid

¼	3
⅜	3½
½	4
¾	4½
1	5
1¼	†6
1½	†8
2	†10
2½	†12

Countersunk

¼	2
⅜	2½
½	3
¾	3½
1	4
1¼	5
1½	6

LOCK NUTS

Lock Nuts

*2½	* 6
*3	* 7
*3½	* 8
*4	* 9
*4½	*10
*5	*12

Such sizes as are marked with an * are carried in stock galvanized.
†These sizes are Bar Pattern.

LIST OF SIZES

STANDARD CAST IRON FITTINGS

BUSHINGS

Reducing one size only, are malleable up to 2½ inch, inclusive.

Size	Size	Size	Size	Size
¼x ⅛	1½x ⅜	3 x1¼	4½x4	7x 5
	1½x ½	3 x1½		7x 6
⅜x ⅛	1½x ¾	3 x2	5 x1	
⅜x ¼	1½x1	3 x2½	5 x2	8x 2
½x ⅛	1½x1¼		5 x2½	8x 2½
½x ¼		3½x1	5 x3	8x 3
½x ⅜	2 x ¼	3½x1¼	5 x3½	8x 4
	2 x ⅜	3½x1½	5 x4	8x 5
¾x ¼	2 x ½	3½x2	5 x4½	8x 6
¾x ⅜	2 x ¾	3½x2½		8x 7
¾x ½	2 x1	3½x3	6 x1½	
	2 x1¼		6 x2	9x 6
1 x ¼	2 x1½	4 x1	6 x2½	9x 7
1 x ⅜		4 x1¼	6 x3	9x 8
1 x ½	2½x ½	4 x1½	6 x3½	
1 x ¾	2½x ¾	4 x2	6 x4	10x 4
	2½x1	4 x2½	6 x4½	10x 5
1¼x ¼	2½x1¼	4 x3	6 x5	10x 6
1¼x ⅜	2½x1½	4 x3½		10x 7
1¼x ½	2½x2		7 x2	10x 8
1¼x ¾		4½x2	7 x2½	10x 9
1¼x1	3 x ½	4½x2½	7 x3	
	3 x ¾	4½x3	7 x3½	12x 6
1½x ¼	3 x1	4½x3½	7 x4	12x 8
			7 x4½	12x10

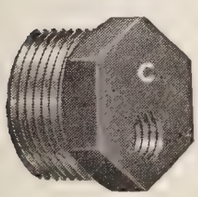
We also keep in stock, Galvanized Bushings, ½ to 6 inch, inclusive,

FACE BUSHINGS

MALLEABLE IRON

Size	Size	Size	Size	Size	Size
⅜x ¼	1¼ x¾	2 x1¼	3½x2	4½x4	7 x5
	1¼x1	2 x1½	3½x2½		7 x6
½x ⅜		2½x1¼	3½x3	*5 x3	
	1½x ¾	2½x1½		5 x4	8 x6
¾x ⅜	1½x1	2½x2		5 x4½	8 x7
¾x ½	1½x1¼		*4 x2		
		3 x1½	4 x2½	*6 x3	10 x 8
1 x ½	2 x ¾	3 x2	4 x3	*6 x4	
1 x¾	2 x1	3 x2½	4 x3½	6 x5	12 x10

*These sizes are made in Cast Iron only.



ECCENTRIC BUSHINGS

CAST IRON

Size	Size	Size	Size	Size
1¼x ½	2 x ¾	2½x1½	3 x2	4 x2½
1¼x ¾	2 x1			4 x3
	2 x1¼	3 x ¾	4 x1	
1½x ½		3 x1	4 x1¼	5 x2
1½x ¾		3 x1¼	4 x1½	5 x4
	2½x1	3 x1½	4 x2	
2 x ½	2½x1¼			6 x4

Other sizes made to order.

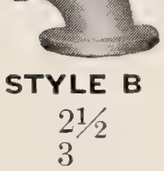
AMERICAN STANDARD SPRINKLER FITTINGS

LIST OF SIZES

ELBOWS

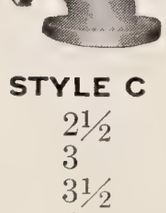
STYLE A

2½
3
3½
4
5
6



STYLE B

2½
3
3½
4
5
6



STYLE C

2½
3
3½
4
5
6

STYLE D

3
4
5
6

TEES

STYLE G

2½
2½x2½x2
2½x2 x2½
2 x2 x2½

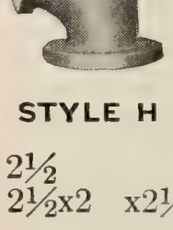
3
3 x3 x2½
3 x2½x3
3 x2½x2½
3 x2 x3
3 x2 x2½
2½x2½x3
2½x2 x3

3½
3½x3½x3
3½x3½x2½
3½x3 x3½
3½x3 x3
3½x3 x2½
3½x2½x3½
3½x2½x3
3½x2½x2½
3½x2 x3½
3½x2 x3
3 x3 x3½
3 x2½x3½
3 x2 x3½
2½x2½x3½

4
4 x4 x3½
4 x4 x3
4 x4 x2½
4 x3½x4
4 x3½x3½
4 x3½x3
4 x3½x2½
4 x3 x4
4 x3 x3½
4 x3 x3
4 x3 x2½
4 x2½x4
4 x2½x3½
3½x3½x4
3½x3 x4
3½x2½x4
3 x3 x4
3 x2½x4

5
5 x5 x4
5 x5 x3½
5 x5 x3
5 x5 x2½
5 x4 x5
5 x4 x4
5 x4 x3½
5 x4 x3
5 x4 x2½
5 x3½x5
5 x3½x4
5 x3½x3½
5 x3 x5
5 x3 x4
5 x3 x3½
5 x2½x5
5 x2½x4
4 x4 x5
4 x3½x5
4 x3 x5
4 x2½x5
3½x3½x5
3½x3 x5

6
6 x6 x5
6 x6 x4
6 x6 x3½
6 x6 x3
6 x5 x6
6 x5 x5
6 x5 x4
6 x5 x3½
6 x5 x3
6 x4 x6
6 x4 x5
6 x4 x4
6 x3½x6
6 x3½x5
6 x3 x6
5 x5 x6
5 x4 x6
5 x3½x6
5 x3 x6
4 x4 x6
4 x3½x6



STYLE H

2½
2½x2 x2½

3
3 x3 x2½
3 x2½x3
3 x2½x2½

AMERICAN STANDARD SPRINKLER FITTINGS

LIST OF SIZES

STYLE H CONTINUED

3½

3½x3½x3
3½x3½x2½
3½x3 x3½
3½x3 x3
3½x3 x2½
3½x2½x3½
3½x2½x3
3½x2½x2½

4

4 x4 x3½
4 x4 x3
4 x4 x2½
4 x3½x4
4 x3½x3½
4 x3½x3
4 x3½x2½
4 x3 x4
4 x3 x3½
4 x3 x3
4 x2½x4
4 x2½x3½

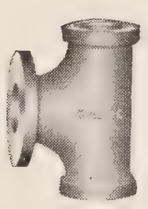
5

5 x5 x4
5 x5 x3½
5 x5 x3
5 x5 x2½
5 x4 x5
5 x4 x4
5 x4 x3½
5 x4 x3
5 x3½x5
5 x3½x4
5 x3½x3½
5 x3 x5
5 x3 x4
5 x2½x5

6

6 x6 x5
6 x6 x4
6 x6 x3½
6 x6 x3
6 x5 x6
6 x5 x5
6 x5 x4
6 x5 x3
6 x4 x6
6 x4 x5
6 x4 x4
6 x3½x6
6 x3½x5
6 x3 x6

The largest opening on run is the flanged opening.



STYLE K

2½

2½x2 x2½
2 x2 x2½

3

3 x2½x3
3 x2 x3
2½x2½x3
2½x2 x3

3½

3½x3 x3½
3½x2½x3½
3 x3 x3½
3 x2½x3½
3 x2 x3½
2½x2½x3½

4

4 x3 x4
4 x2½x4
3½x3½x4
3½x3 x4
3½x2½x4
3 x3 x4
3 x2½x4

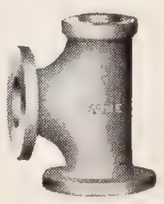
5

5 x4 x5
5 x3½x5
5 x3 x5
4 x4 x5
4 x3½x5
4 x3 x5
3½x3½x5
3½x3 x5

6

6 x5 x6
6 x4 x6
6 x3½x6
6 x3 x6

5 x5 x6
5 x4 x6
5 x3½x6
5 x3 x6
4 x4 x6
4 x3½x6



STYLE L

2½

3

3½

3½x3½x3

4

4 x4 x3
4 x3½x4
4 x3 x4

5

5 x5 x4
5 x4 x5
5 x3½x5

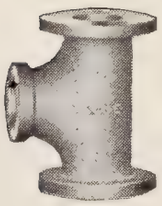
6

6 x6 x5
6 x6 x4
6 x5 x6
6 x4 x6

AMERICAN STANDARD SPRINKLER FITTINGS

LIST OF SIZES

TEES

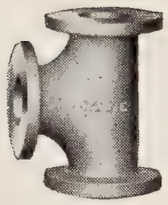


STYLE M

4

5

6



STYLE N

3

4

5

5 x5 x4

6

6 x6 x4

CROSSES

STYLE P

2½

2½x2½x2½x2

3

3 x3 x3 x2½

3 x3 x2½x2½

3½

3½x3½x3½x3

3½x3½x3½x2½

3½x3½x3 x3

3½x3½x3 x2½

3½x3½x2½x2½

3½x2½x2½x2½

4

4 x4 x4 x3½

4 x4 x4 x3

4 x4 x3½x3½

4 x4 x3½x3

4 x4 x3½x2½

4 x4 x3 x3

4 x4 x3 x2½

4 x3 x2½x2½

4 x2½x2½x2½

5

5 x5 x5 x4

5 x5 x5 x3½

5 x5 x5 x3

5 x5 x4 x4

5 x5 x4 x3½

5 x5 x4 x3

5 x5 x4 x2½

5 x5 x3½x3½

5 x5 x3½x3

5 x4 x3 x3

5 x3 x2½x2½

6

6 x6 x5 x5

6 x6 x5 x4

6 x6 x5 x3½

6 x6 x5 x3

6 x6 x4 x4

6 x6 x4 x3½

6 x5 x4 x4

6 x4 x4 x4

In describing Crosses the run openings are named first, then the outlets.

LONG SWEEP FITTINGS

LIST OF SIZES

ELBOWS

No. 1

* 3/4
*1
*1¼
*1½
*2
*2½
*3
*3½
*4
4½
*5
*6
7
8
9
10
12

DOUBLE BRANCH No. 2

1 x1 x1
1¼x1¼x1¼
†1 x1 x1¼
1½x1½x1½
†1¼x1¼x1½
2 x2 x2
†1½x1½x2
2½x2½x2½
†2 x2 x2½
3 x3 x3
†2 x2 x3
†2½x2½x3
3½x3½x3½
4 x4 x4
†3 x3 x4
†2½x2½x4
4½x4½x4½
5 x5 x5
6 x6 x6
7 x7 x7
8 x8 x8
9 x9 x9
10 x10 x10
12 x12 x12

In describing No. 2 Double Branch Elbows the run openings are named first, then the inlet.

TEES

SINGLE SWEEP No. 3

A	B	C
*1	x1	x1
*1¼	x1¼	x1¼
†1¼	x1¼	x1
†1¼	x1	x1
*1½	x1½	x1½
1½	x1½	x1¼
†1½	x1½	x1
1½	x1¼	x1¼
†1½	x1¼	x1
*2	x2	x2
†2	x2	x1½
†2	x2	x1¼
†2	x2	x1
†2	x1½	x1½
*2½	x2½	x2½
†2½	x2½	x2
†2½	x2½	x1½
2½	x2½	x1¼
†2½	x2	x2
2½	x2	x1½
*3	x3	x3
†3	x3	x2½
†3	x3	x2
†3	x3	1½
†3	x3	1¼
†3	x2½	x2
3½	x3½	x3½
3½	x3½	x2
†3½	x3½	x1½
†3½	x3½	x1¼
†3½	x3	x2
*4	x4	x4
†4	x4	x3
4	x4	x2½
4	x4	x2
4	x4	x1½
†4	x 3	x3
4½	x4½	x4½
5	x5	x5
5	x5	x3
†5	x5	x2
6	x6	x6
†6	x6	x2
7	x7	x7
8	x8	x8
9	x9	x9
10	x10	x10
12	x12	x12

Such sizes as are marked with an * are carried in stock galvanized.

Sizes indicated by † are bushed in the sand from the nearest size pattern hat we have.

LONG SWEEP FITTINGS

LIST OF SIZES

TEES

No. 5

1 x1 x1

1¼x1¼x1¼

1½x1½x1½

2 x2 x2
†2 x2 x1
†2 x1½x1½
†2 x1½x1

2½x2½x2½
2½x2½x2
†2½x2½x1½
†2½x2½x1
2½x2 x2½
†2½x2 x2
†2½x2 x1½
2 x2 x2½

3 x3 x3
3 x3 x2½
†3 x3 x2
†3 x3 x1½
†3 x3 x1

3 x2½x3
3 x2½x2½
†3 x2½x2
3 x2 x3
†3 x2 x2½
2½x2½x3
2½x2 x3

3½x3½x3½
3½x3½x3
3½x3½x2½
3½x3 x3½
3½x3 x3
3½x3 x2½
†3½x3 x2
3½x2½x3½
3½x2½x3
†3½x2½x2½
3½x2 x3½
†3½x2 x3
3 x3 x3½
3 x2½x3½
3 x2 x3½
2½x2½x3½

4 x4 x4
4 x4 x3½
4 x4 x3
†4 x4 x2½
4 x3½x4
4 x3½x3½
4 x3½x3
†4 x3½x2½
4 x3 x4
4 x3 x3½
4 x3 x3

†4 x3 x2½
4 x2½x4
†4 x2½x3½
3½x3½x4
3½x3 x4
3½x2½x4
3 x3 x4
3 x2½x4

4½x4½x4½

5 x5 x5
5 x5 x4
5 x5 x3½
5 x5 x3
5 x5 x2½
5 x4 x5
5 x4 x4
†5 x4 x3½
5 x4 x3
†5 x4 x2½
5 x3½x5
5 x3½x4
5 x3½x3½
5 x3 x5
†5 x3 x4½
5 x3 x4
†5 x3 x3½
5 x2½x5
†5 x2½x4
4 x4 x5
4 x3½x5
4 x3 x5
†4 x2½x5
3½x3½x5
3½x3 x5

6 x6 x6
6 x6 x5
6 x6 x4
†6 x6 x3½
6 x6 x3
6 x5 x6
6 x5 x5
6 x5 x4
†6 x5 x3½
†6 x5 x3
6 x4 x6
6 x4 x5
†6 x4 x4
6 x3½x6
†6 x3½x5
6 x3 x6
5 x5 x6
5 x4 x6
5 x3½x6
†5 x3 x6
4 x4 x6
†4 x3½x6

7 x7 x7

8 x8 x8
8 x8 x6
8 x8 x4

9 x9 x9

10 x10 x10

12 x12 x12

Sizes indicated by † are bushed in the sand from the nearest size pattern that we have.

LONG SWEEP FITTINGS

LIST OF SIZES

CROSSES

No. 4

1x1x1x1

1¼x1¼x1¼x1¼

1½x1½x1½x1½

2x2x2x2

2½x2½x2½x2½
†2½x2½x1½x1½

3x3x3x3
†3x3x1½x1½

3½x3½x3½x3½

4x4x4x4
†4x4x2½x2½

5x5x5x5
5x5x4x4
†5x5x3x3

6x6x6x6
6x6x4x4

7x7x7x7

8x8x8x8
8x8x6x6
8x8x4x4

9x9x9x9

10x10x10x10

12x12x12x12

In describing Crosses the run openings are named first, then the outlets.

Sizes indicated by † are bushed in the sand from the nearest size pattern that we have.

LIST OF SIZES

EXTRA HEAVY

CAST IRON FITTINGS

FOR STEAM WORKING PRESSURES UP TO 250 POUNDS

The following Straight and Reducing Elbows are carried in stock. Other sizes will be made to order by bushing in the sand, at a special price, according to quantity wanted.

REDUCING ELBOWS

* ½x ½	1½x1¼	2½x1½	5x 5
* ¾x ¾	1½x1	*3 x3	5x 4
¾x ½	*2 x2	3 x2½	6x 6
*1 x1	2 x1½	3 x2	7x 7
1 x¾	2 x1¼	3½x3½	8x 8
*1¼x1¼	2 x1	*4 x4	10x10
1¼x1	*2½x2½	4 x3	12x12
*1½x1½	2½x2	4½x4½	

45° ELBOWS

* ½	*1¼	*2½	*4	6	10
* ¾	*1½	*3	4½	7	12
*1	*2	3½	5	8	

CROSSES

1	2	3½	5	8
1¼	2½	4	6	10
1½	3	4½	7	12

Y BENDS

1¼	2	3	6	8
1½	2½	4	7	

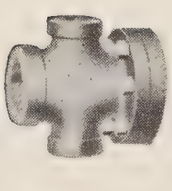
45° Elbows and Crosses are not carried in stock in reducing sizes, but will be made to order by bushing in the sand from straight patterns, at a special price, according to quantity wanted.

Such sizes as are marked with an * are carried in stock Galvanized.

FOR PRICE LIST OF EXTRA HEAVY CAST IRON FITTINGS, SEE PAGE 406
FOR GENERAL DIMENSIONS, SEE PAGE 644

EXTRA HEAVY CAST IRON

BLOW-OFF CROSSES



2½x2½	3x2	4x2	4x2½

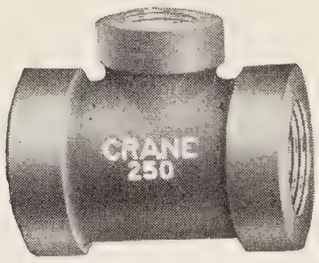
FOR PRICE LIST OF EXTRA HEAVY CAST IRON BLOW-OFF CROSSES, SEE PAGE 209

LIST OF SIZES

EXTRA HEAVY

CAST IRON TEES

FOR STEAM WORKING PRESSURES UP TO 250 POUNDS



REDUCING TEES

The following Straight and Reducing Tees are carried in stock. Other sizes will be made to order by bushing in the sand, at a special price, according to quantity wanted.

REDUCING TEES

* ½x ½x ½
* ¾x ¾x ¾
¾x ¾x ½
¾x ¾x ¼
*1 x1 x1
1 x1 x ¾
1 x1 x ½
1 x1 x ¼
1 x ¾x ¾
1 x ¾x ½
1 x ½x1
¾x ¾x1
*1¼x1¼x1¼
1¼x1¼x1
1¼x1¼x ¾
1¼x1¼x ½
1¼x1¼x ¼
1¼x1 x1¼
1¼x1 x1
1¼x ¾x1¼
1¼x ½x1¼
1¼x ¼x1¼
1 x1 x1¼
*1½x1½x1½
1½x1½x1¼
1½x1½x1
1½x1½x ¾
1½x1½x ½
1½x1½x ¼
1½x1¼x1½
1½x1¼x1¼
1½x1 x1½
1½x ¾x1½
1½x ½x1½
*2 x2 x2
2 x2 x1½
2 x2 x1¼
2 x2 x1
2 x2 x ¾
2 x2 x ½
2 x2 x ¼
2 x1½x2
2 x1½x1½
2 x1½x1
2 x1¼x2
2 x1¼x1¼
2 x1 x2
2 x1 x1½
2 x ¾x2
2 x ½x2
1½x1½x2
1¼x1¼x2
*2½x2½x2½
2½x2½x2
2½x2½x1½
2½x2½x1¼
2½x2½x1
2½x2½x ¾
2½x2½x ½
2½x2 x2½
2½x2 x2
2½x2 x1½
2½x1½x2½
2½x1½x2
2½x1½x1½
2½x ¾x2½
2 x2 x2½
1½x1½x2½
*3 x3 x3
3 x3 x2½
3 x3 x2
3 x3 x1½
3 x3 x1¼
3 x3 x1
3 x2½x3
3 x2½x2½
3 x2½x2
3 x2½x1½
3 x2 x3
3 x2 x2
3 x2 x1½
3 x1½x2
3 x1 x3
2½x2½x3
2 x2 x3
3½x3½x3½
3½x3½x2
3½x2½x2½
*4 x4 x4
4 x4 x3
4 x4 x2½
4 x4 x2
4 x4 x1½
4 x4 x1¼
4 x4 x1
4 x3 x4
4 x3 x3
4 x2½x4
4 x2½x2½
4 x2 x4
3 x3 x4
4½x4½x4½
5 x5 x5
5 x5 x4
5 x5 x3
5 x5 x2½
5 x5 x2
5 x3 x5
5 x2 x5
6 x6 x6
6 x6 x5
6 x6 x4
6 x6 x3
6 x6 x2½
6 x6 x2
6 x4 x6
6 x4 x4
7 x7 x7
7 x7 x5
8 x8 x8
8 x8 x6
8 x8 x5
8 x8 x4
8 x8 x3
8 x6 x6
8 x6 x4
10x10x10
10x10x 8
10x10x 6
10x10x 4
12x12x12
12x12x10
12x12x 8
12x12x 6

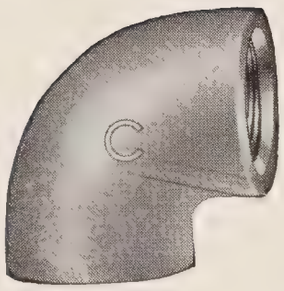
Such sizes as are marked with an * are carried in stock Galvanized.

FOR PRICE LIST OF EXTRA HEAVY CAST IRON FITTINGS, SEE PAGE 406
FOR GENERAL DIMENSIONS, SEE PAGE 644

MALLEABLE IRON FITTINGS

REVISED CLASSIFICATION

Adopted June 5, 1907



PLAIN

ELBOWS

BANDED

	Size	Class
*Banded and Plain	1/8×	A
*Banded and Plain	1/4× 1/8	A
*Banded and Plain	1/4	B
*Banded and Plain	3/8× 1/8	A
*Banded and Plain	3/8× 1/4	B
*Banded and Plain	3/8	B
*Plain	1/2× 1/8	A
*Banded and Plain	1/2× 1/4	B
*Banded and Plain	1/2× 3/8	B
*Banded and Plain	1/2	B
*Banded and Plain	3/4× 3/8	B
*Banded and Plain	3/4× 1/2	B
*Banded and Plain	3/4	C
*Plain	1 × 3/8	B
*Banded and Plain	1 × 1/2	B
*Banded and Plain	1 × 3/4	C
*Banded and Plain	1	C
*Banded	1 1/4× 1/2	B
*Banded	1 1/4× 3/4	C
*Banded and Plain	1 1/4×1	C
*Banded and Plain	1 1/4	C
*Banded	1 1/2× 3/4	C

	Size	Class
*Banded	1 1/2×1	C
*Banded and Plain	1 1/2×1 1/4	C
*Banded and Plain	1 1/2	C
Banded	2 × 3/4	C
*Banded	2 ×1	C
*Banded	2 ×1 1/4	C
*Banded and Plain	2 ×1 1/2	C
*Banded and Plain	2	C
*Banded	2 1/2×1 1/2	C
*Banded	2 1/2×2	C
*Banded	2 1/2	C
*Banded	3 ×2	C
*Banded	3 ×2 1/2	C
*Banded	3	C
*Banded	3 1/2×3	C
*Banded	3 1/2	C
*Banded	4 ×3	C
*Banded	4 ×3 1/2	C
*Banded	4	C
*Banded	4 1/2	C
*Banded	5	C
*Banded	6	C

RIGHT AND LEFT ELBOWS

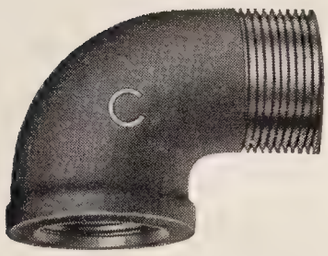
	Size	Class
*Banded	1/4× 1/4	A
*Banded	3/8× 3/8	A
*Banded	1/2× 1/2	B
*Banded	3/4× 3/4	B

	Size	Class
*Banded	1 ×1	B
*Banded	1 1/4×1 1/4	C
*Banded	1 1/2×1 1/2	C
*Banded	2 ×2	C

In ordering, be particular to mention Banded or Plain, Black or Galvanized. Such sizes as are marked with an * are also carried in stock Galvanized.

MALLEABLE IRON FITTINGS

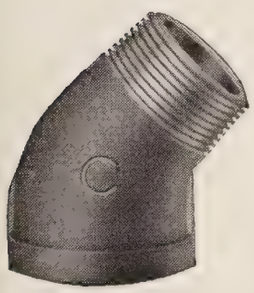
REVISED CLASSIFICATION—CONTINUED



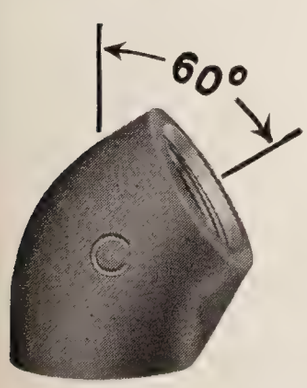
STREET ELBOWS

	A	B	Class
*Banded	1/8		A
*Banded	1/4		B
*Banded	3/8		B
*Banded	1/2		B
*Banded	3/4	× 1/2	B
*Banded	3/4		B
*Banded	1	× 1/2	B
*Banded	1	× 3/4	B
*Banded	1		C
*Banded	1 1/4	× 3/4	C
*Banded	1 1/4	× 1	C
*Banded	1 1/4		C
Banded	1 1/2	× 1	C
*Banded	1 1/2	× 1 1/4	C
*Banded	1 1/2		C
*Banded	2	× 1 1/4	C
*Banded	2	× 1 1/2	C
*Banded	2		C
*Banded	2 1/2		C
*Banded	2 1/2	× 2	C
*Banded	3		C
*Banded	3	× 2 1/2	C
*Banded	3 1/2		C
*Banded	4		C
Banded	5		C
Banded	6		C

45° STREET ELBOWS



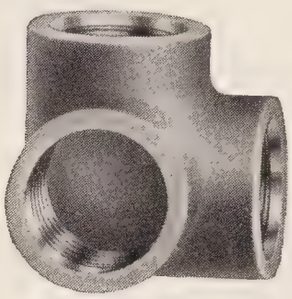
	Size	Class
*Banded	1/4	A
*Banded	3/8	A
*Banded	1/2	B
*Banded	3/4	B
*Banded	1	B
*Banded	1 1/4	B
*Banded	1 1/2	B
*Banded	2	B
*Banded	3	B
*Banded	4	B



60° ELBOWS

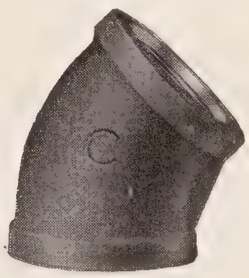
	Size	Class
Banded	1 1/4	B
*Plain	1 1/4	B
*Plain	1 1/2	B
*Plain	2	B

ELBOWS WITH SIDE OUTLET



	Size	Class
*Plain	3/8 × 3/8 × 1/4	B
*Plain	3/8 × 3/8 × 3/8	B
*Plain	1/2 × 1/2 × 3/8	B
*Plain	1/2 × 1/2 × 1/2	B
*Plain	3/4 × 3/4 × 3/8	B
*Plain	3/4 × 3/4 × 1/2	B
*Plain	3/4 × 3/4 × 3/4	B
*Plain	1 × 1 × 3/4	B
*Plain	1 × 1 × 1	B
*Plain	1 1/4 × 1 1/4 × 1	B
*Plain	1 1/4 × 1 1/4 × 1 1/4	B
*Plain	1 1/2 × 1 1/2 × 1 1/2	B
*Plain	2 × 2 × 2	B

45° ELBOWS



	Size	Class
*Banded	1/4	B
*Banded	3/8	B
*Banded and Plain	1/2	B
*Banded and Plain	3/4	B
*Banded and Plain	1	B
*Banded and Plain	1 1/4	B
*Banded and Plain	1 1/2	B
*Banded and Plain	2	B
*Banded	2 1/2	C
*Banded	3	C
*Banded	3 1/2	C
*Banded	4	C
*Banded	4 1/2	C
*Banded	5	C
*Banded	6	C

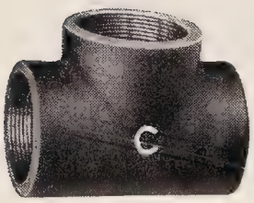
In ordering, be particular to mention Banded or Plain, Black or Galvanized.

Such sizes as are marked with an * are also carried in stock Galvanized.

MALLEABLE IRON FITTINGS

REVISED CLASSIFICATION, CONTINUED

TEES



PLAIN

BANDED

In describing Tees the run is first named, then the outlet, thus:

$\frac{1}{2} \times \frac{1}{2} \times \frac{3}{4} = \frac{1}{2} \times \frac{3}{4}$

$\frac{1}{2} \times \frac{3}{8} \times \frac{3}{4} = \frac{1}{2} \times \frac{3}{8} \times \frac{3}{4}$

	Size	Class
*Banded and Plain	1/8x1/8x1/8	A
*Banded and Plain	1/8x1/8x1/4	A
*Banded and Plain	1/4x1/4x1/8	A
*Banded and Plain	1/4x1/4x1/4	B
*Banded and Plain	1/4x1/4x3/8	B
*Banded and Plain	3/8x1/4x1/4	B
*Banded and Plain	3/8x1/4x3/8	B
*Banded and Plain	3/8x3/8x1/8	A
*Banded and Plain	3/8x3/8x1/4	B
*Banded and Plain	3/8x3/8x3/8	B
*Banded and Plain	3/8x3/8x1/2	B
*Banded and Plain	1/2x1/4x1/2	B
*Banded and Plain	1/2x3/8x1/4	B
*Banded and Plain	1/2x3/8x3/8	B
*Banded and Plain	1/2x3/8x1/2	B
*Banded and Plain	1/2x1/2x1/4	B
*Banded and Plain	1/2x1/2x3/8	B
*Banded and Plain	1/2x1/2x1/2	B
*Plain	3/8x3/8x3/4	B
*Plain	1/2x3/8x3/4	B
*Banded and Plain	1/2x1/2x3/4	B
*Banded and Plain	3/4x1/4x3/4	B
*Plain	3/4x3/8x3/8	B
*Plain	3/4x3/8x1/2	B
*Plain	3/4x3/8x3/4	B
*Plain	3/4x1/2x1/4	B
*Banded and Plain	3/4x1/2x3/8	B
*Banded and Plain	3/4x1/2x1/2	B
*Banded and Plain	3/4x1/2x3/4	B
*Banded and Plain	3/4x3/4x1/4	B

	Size	Class
*Banded and Plain	3/4x 3/4x 3/8	B
*Banded and Plain	3/4x 3/4x 1/2	B
*Banded and Plain	3/4x 3/4x 3/4	C
*Banded	1/2x 1/2x1	B
*Plain	3/4x 3/8x1	B
*Plain	3/4x 1/2x1	B
*Banded and Plain	3/4x 3/4x1	C
*Plain	1 x 3/8x 1/2	B
*Plain	1 x 3/8x 3/4	B
*Banded and Plain	1 x 3/8x1	B
*Plain	1 x 1/2x 3/8	B
*Banded and Plain	1 x 1/2x 1/2	B
*Banded and Plain	1 x 1/2x 3/4	B
*Banded and Plain	1 x 1/2x1	B
*Plain	1 x 3/4x 3/8	B
*Banded and Plain	1 x 3/4x 1/2	B
*Banded and Plain	1 x 3/4x 3/4	C
*Banded and Plain	1 x 3/4x1	C
*Plain	1 x1 x 1/4	B
*Banded and Plain	1 x1 x 3/8	B
*Banded and Plain	1 x1 x 1/2	B
*Banded and Plain	1 x1 x 3/4	C
*Banded and Plain	1 x1 x1	C
*Banded	3/4x 3/4x1 1/4	C
*Banded	1 x 3/4x1 1/4	C
*Banded and Plain	1 x1 x1 1/4	C
*Banded and Plain	1 1/4x 3/8x1 1/4	B
*Banded	1 1/4x 1/2x1	B
*Banded	1 1/4x 1/2x1 1/4	B

In ordering, be particular to mention Banded or Plain, Black or Galvanized.

Such sizes as are marked with an * are also carried in stock Galvanized.

MALLEABLE IRON FITTINGS

REVISED CLASSIFICATION—CONTINUED

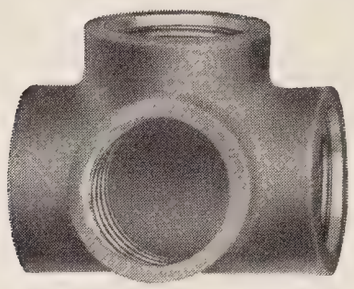
TEES—CONTINUED

	Size	Class
*Banded	1¼x ¾x ¾	C
*Banded	1¼x ¾x1	C
*Banded	1¼x ¾x1¼	C
*Plain	1¼x1 x ⅜	B
*Banded	1¼x1 x ½	B
*Banded	1¼x1 x¾	C
*Banded and Plain	1¼x1 x1	C
*Banded and Plain	1¼x1 x1¼	C
*Banded and Plain	1¼x1¼ ⅜	B
*Banded and Plain	1¼x1¼x ½	B
*Banded and Plain	1¼x1¼x ¾	C
*Banded and Plain	1¼x1¼x1	C
*Banded and Plain	1¼x1¼x1¼	C
*Banded	1 x1 x1½	C
*Banded	1¼x1 x1½	C
*Banded	1¼x1¼x1½	C
*Banded	1½x ⅜x1½	B
*Banded	1½x ½x1½	B
*Banded	1½x ¾x ¾	C
Banded	1½x ¾x1	C
Banded	1½x ¾x1¼	C
*Banded	1½x ¾x1½	C
*Banded	1½x1 x1	C
*Banded	1½x1 x1¼	C
*Banded	1½x1 x1½	C
*Banded	1½x1¼x ½	B
*Banded	1½x1¼x¾	C
*Banded	1½x1¼x1	C
*Banded	1½x1¼x1¼	C
*Banded and Plain	1½x1¼x1½	C
*Banded	1½x1½x ⅜	B
*Banded	1½x1½x ½	B
*Banded and Plain	1½x1½x ¾	C
*Banded and Plain	1½x1½x1	C
*Banded and Plain	1½x1½x1¼	C
*Banded and Plain	1½x1½x1½	C
*Banded	1 x1 x2	C
*Banded	1¼x1¼x2	C
*Banded	1½x1¼x2	C
*Banded and Plain	1½x1½x2	C
Banded	2 x ⅜x2	B
*Banded	2 x ½x2	B
*Banded	2 x ¾x2	C
Banded	2 x1 x1	C
Banded	2 x1 x1¼	C
Banded	2 x1 x1½	C
*Banded	2 x1 x2	C
*Banded	2 x1¼x1¼	C
*Banded	2 x1¼x1½	C
*Banded	2 x1¼x2	C
*Banded	2 x1½x1	C
*Banded	2 x1½x1¼	C
*Banded and Plain	2 x1½x1½	C
*Banded and Plain	2 x1½x2	C
*Banded	2 x2 x ⅜	B
*Banded	2 x2 x ½	B
*Banded and Plain	2 x2 x ¾	C
*Banded and Plain	2 x2 x1	C
*Banded and Plain	2 x2 x1¼	C
*Banded and Plain	2 x2 x1½	C
*Banded and Plain	2 x2 x2	C
*Banded	2 x2 x2½	C
*Banded	2½x2 x1½	C
*Banded	2½x2 x2	C
Banded	2½x1½x1½	C
Banded	2½x1½x2	C
*Banded	2½x1½x2½	C
*Banded	2½x2 x2½	C
*Banded	2½x2½x ¾	C
*Banded	2½x2½x1	C
*Banded	2½x2½x1¼	C
*Banded	2½x2½x1½	C
*Banded	2½x2½x2	C
*Banded	2½x2½x2½	C
*Banded	2½x2½x3	C
*Banded	2 x2 x3	C
*Banded	3 x2 x2	C
*Banded	3 x2 x2½	C
*Banded	3 x2 x3	C
*Banded	3 x2½x2	C
Banded	3 x2½x2½	C
*Banded	3 x2½x3	C
*Banded	3 x3 x ¾	C
*Banded	3 x3 x1	C
*Banded	3 x3 x1¼	C
*Banded	3 x3 x1½	C
*Banded	3 x3 x2	C
*Banded	3 x3 x2½	C
*Banded	3 x3 x3	C
*Banded	3½x3½x2½	C
*Banded	3½x3½x3	C
*Banded	3½x3½x3½	C
*Banded	4 x3 x4	C
*Banded	4 x3 x3	C
*Banded	4 x4 x1	C
*Banded	4 x4 x1¼	C
*Banded	4 x4 x1½	C
*Banded	4 x4 x2	C
*Banded	4 x4 x2½	C
*Banded	4 x4 x3	C
*Banded	4 x4 x3½	C
*Banded	4 x4 x4	C
*Banded	4½x4½x4½	C
*Banded	5 x5 x2	C
*Banded	5 x5 x3	C
*Banded	5 x5 x4	C
*Banded	5 x5 x5	C
*Banded	6 x6 x2	C
*Banded	6 x6 x2½	C
*Banded	6 x6 x3	C
*Banded	6 x6 x4	C
*Banded	6 x6 x6	C

In ordering, be particular to mention Banded or Plain, Black or Galvanized.
Such sizes as are marked with an * are also carried in stock Galvanized..

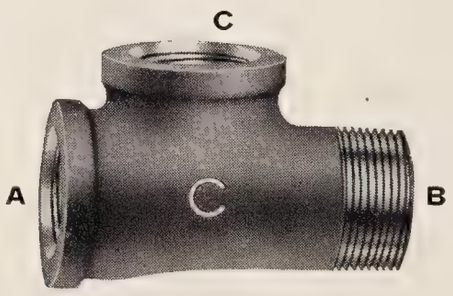
MALLEABLE IRON FITTINGS

REVISED CLASSIFICATION CONTINUED



FOUR-WAY TEES

	Size	Class
*Plain	3/8	B
*Plain	1/2	B
*Plain	3/4	B
*Plain	1	B
*Plain	1 1/4	B
*Plain	1 1/2	B
*Plain	2	B



SERVICE TEES

	A	B	C	Class
Banded	1/4	x 1/4	x 1/4	B
*Banded	3/8	x 3/8	x 3/8	B
*Banded	1/2	x 1/2	x 1/2	B
*Banded	3/4	x 3/4	x 3/4	B
Banded	3/4	x 1/2	x 3/4	B
Banded	3/4	x 3/4	x1	B
*Banded	1	x 3/4	x1	B
*Banded	1	x1	x 3/4	B
*Banded	1	x1	x1	C
Banded	1	x1	x1 1/4	C
*Banded	1 1/4	x 3/4	x1 1/4	C
*Banded	1 1/4	x1	x1 1/4	C
*Banded	1 1/4	x1 1/4	x1 1/4	C
Banded	1 1/4	x1	x1	C
*Banded	1 1/2	x 3/4	x1 1/2	C
*Banded	1 1/2	x1	x1 1/2	C
*Banded	1 1/2	x1 1/4	x1 1/2	C
*Banded	1 1/2	x1 1/2	x1 1/2	C
*Banded	2	x1 1/2	x2	C
*Banded	2	x2	x2	C
Banded	2 1/2	x2	x2 1/2	C
Banded	2 1/2	x2 1/2	x2 1/2	C
Banded	3	x2 1/2	x3	C
Banded	3	x3	x3	C
Banded	3	x3	x4	C

OTHER VARIATIONS, SERVICE TEES

Size	Class
* 3/4 Female x 3/4 Female x 3/4 Male	Banded B
1 1/4 Female x 1 1/4 Female x 1 Male	Plain C

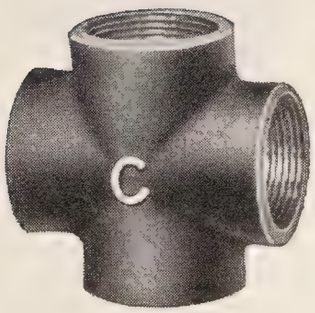
In ordering, be particular to mention Banded or Plain, Black or Galvanized.

Such sizes as are marked with an * are also carried in stock Galvanized.

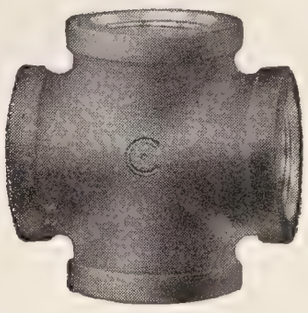
MALLEABLE IRON FITTINGS

REVISED CLASSIFICATION CONTINUED

CROSSES



PLAIN



BANDED

The outlets of Crosses listed below are the same size, and both are denoted by the last figure.

	Size	Class
Banded	1/8 x 1/8 x 1/8	A
Banded	1/4 x 1/4 x 1/8	A
*Banded and Plain	1/4 x 1/4 x 1/4	B
Banded and Plain	3/8 x 3/8 x 1/4	B
*Banded and Plain	3/8 x 3/8 x 3/8	B
*Plain	1/2 x 3/8 x 3/8	B
*Banded and Plain	1/2 x 1/2 x 1/4	B
*Banded and Plain	1/2 x 1/2 x 3/8	B
*Banded and Plain	1/2 x 1/2 x 1/2	B
Plain	3/4 x 3/8 x 1/2	B
*Plain	3/4 x 1/2 x 3/8	B
*Plain	3/4 x 1/2 x 1/2	B
*Banded and Plain	3/4 x 3/4 x 3/8	B
*Banded and Plain	3/4 x 3/4 x 1/2	B
*Banded and Plain	3/4 x 3/4 x 3/4	B
Plain	1 x 1/2 x 3/8	B
Plain	1 x 3/4 x 3/8	B
Plain	1 x 3/4 x 1/2	B
*Plain	1 x 3/4 x 3/4	B
*Banded and Plain	1 x1 x 3/8	B
*Banded and Plain	1 x1 x 1/2	B
*Banded and Plain	1 x1 x 3/4	B
*Banded and Plain	1 x1 x1	B
*Banded	1 1/4 x1 x 3/4	C
*Banded	1 1/4 x1 x1	C
*Banded	1 1/4 x1 1/4 x 3/8	B
*Banded	1 1/4 x1 1/4 x 1/2	B

	Size	Class
*Banded	1 1/4 x1 1/4 x 3/4	C
*Banded	1 1/4 x1 1/4 x1	C
*Banded and Plain	1 1/4 x1 1/4 x1 1/4	C
*Banded	1 1/2 x1 1/4 x1 1/4	C
*Banded	1 1/2 x1 1/2 x 1/2	B
*Banded	1 1/2 x1 1/2 x 3/4	C
*Banded	1 1/2 x1 1/2 x1	C
*Banded	1 1/2 x1 1/2 x1 1/4	C
*Banded and Plain	1 1/2 x1 1/2 x1 1/2	C
*Banded	2 x2 x 1/2	B
*Banded	2 x2 x 3/4	C
*Banded	2 x2 x1	C
*Banded	2 x2 x1 1/4	C
*Banded and Plain	2 x2 x1 1/2	C
*Banded and Plain	2 x2 x2	C
Banded	2 1/2 x2 1/2 x1 1/2	C
*Banded	2 1/2 x2 1/2 x2	C
*Banded	2 1/2 x2 1/2 x2 1/2	C
*Banded	3 x3 x2	C
*Banded	3 x3 x2 1/2	C
*Banded	3 x3 x3	C
*Banded	3 1/2 x3 1/2 x3 1/2	C
*Banded	4 x4 x2	C
*Banded	4 x4 x3	C
*Banded	4 x4 x4	C
*Banded	5 x5 x5	C
*Banded	6 x6 x6	C

In ordering, be particular to mention Banded or Plain, Black or Galvanized. Such sizes as are marked with an * are also carried in stock Galvanized.

MALLEABLE IRON FITTINGS

REVISED CLASSIFICATION, CONTINUED

DROP ELBOWS

FEMALE

	Size	Drop	Class
*Plain	1/4	x 1/4	B
Plain	3/8	x 1/4	B
*Plain	3/8	x 3/8	B
*Plain	1/2	x 1/2	B
*Plain	3/4	x 1/2	B
*Plain	3/4	x 3/4	B

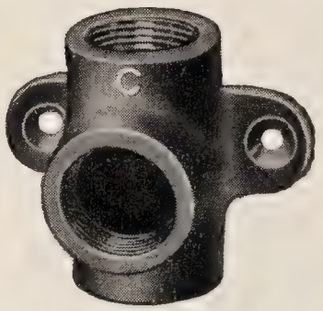
MALE AND FEMALE

	Size	Drop	Class
*Plain	1/4	x 3/8	B
*Plain	3/8	x 3/8	B
*Plain	1/2	x 3/8	B
*Plain	1/2	x 1/2	B

LONG DROP ELBOWS

	Size	Drop	Class
*Plain	1/4	x 3/8	B
*Plain	3/8	x 3/8	B
*Plain	1/2	x 3/8	B
*Plain	1/2	x 1/2	B

DROP TEES

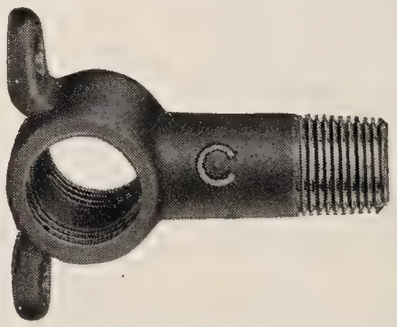


FEMALE

	Size	Drop	Class
Plain	3/8	x 3/8 x 1/4	B
*Plain	3/8	x 3/8 x 3/8	B
Plain	1/2	x 3/8 x 3/8	B
*Plain	1/2	x 1/2 x 3/8	B
*Plain	1/2	x 1/2 x 1/2	B
Plain	3/4	x 1/2 x 3/8	B
*Plain	3/4	x 3/4 x 1/4	B
*Plain	3/4	x 3/4 x 3/8	B
*Plain	3/4	x 3/4 x 1/2	B
*Plain	3/4	x 3/4 x 3/4	B
Plain	1	x1 x 3/8	B

MALE AND FEMALE

	Size	Drop	Class
Plain	1/4	x 1/4 x 3/8	B
Plain	3/8	x 1/4 x 3/8	B
*Plain	3/8	x 3/8 x 3/8	B
Plain	1/2	x 3/8 x 3/8	B
*Plain	1/2	x 1/2 x 3/8	B
Plain	3/4	x 1/2 x 3/8	B
*Plain	3/4	x 3/4 x 3/8	B
Plain	1	x1 x 3/8	B



LONG DROP TEES

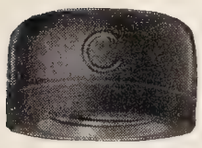
	Size	Drop	Class
*Plain	3/8	x 3/8 x 3/8	B
Plain	3/4	x 3/4 x 1/2	B
Plain	1	x1 x 1/2	B
Plain	1 1/4	x1 1/4 x 1/2	B

In ordering, be particular to mention Black or Galvanized.
Such sizes as are marked with an * are also carried in stock Galvanized.

MALLEABLE IRON FITTINGS

REVISED CLASSIFICATION, CONTINUED

CAPS



	Size	Class
*Plain	1/8	A
*Banded and Plain	1/4	B
*Banded and Plain	3/8	B
*Banded and Plain	1/2	B
*Banded and Plain	3/4	B
*Banded and Plain	1	B
*Banded	1 1/4	C
*Banded	1 1/2	C
*Banded	2	C
*Banded	2 1/2	C
*Banded	3	C
*Banded	3 1/2	C
*Banded	4	C
*Banded	5	C
*Banded	6	C

REDUCERS

	Size	Class
*Banded and Plain	1/4 x 1/8	A
*Banded and Plain	3/8 x 1/8	A
*Banded and Plain	3/8 x 1/4	B
*Plain	1/2 x 1/8	A
*Banded and Plain	1/2 x 1/4	B
*Banded and Plain	1/2 x 3/8	B
*Plain	3/4 x 1/4	B
*Banded and Plain	3/4 x 3/8	B
*Banded and Plain	3/4 x 1/2	B

REDUCERS

	Size	Class
*Plain	1 x 1/4	B
*Plain	1 x 3/8	B
*Banded and Plain	1 x 1/2	B
*Banded and Plain	1 x 3/4	B
*Banded	1 1/4 x 3/8	B
*Banded	1 1/4 x 1/2	B
*Banded	1 1/4 x 3/4	C
*Banded and Plain	1 1/4 x 1	C
*Banded	1 1/2 x 1/2	B
*Banded	1 1/2 x 3/4	C
*Banded	1 1/2 x 1	C
*Banded and Plain	1 1/2 x 1 1/4	C
*Banded	2 x 1/2	B
*Banded	2 x 3/4	C
*Banded	2 x 1	C
*Banded	2 x 1 1/4	C
*Banded	2 x 1 1/2	C
*Banded	2 1/2 x 1	C
*Banded	2 1/2 x 1 1/4	C
*Banded	2 1/2 x 1 1/2	C
*Banded	2 1/2 x 2	C
*Banded	3 x 1	C
*Banded	3 x 1 1/4	C
*Banded	3 x 1 1/2	C
*Banded	3 x 2	C
*Banded	3 x 2 1/2	C
*Banded	3 1/2 x 2	C
*Banded	3 1/2 x 2 1/2	C
*Banded	3 1/2 x 3	C
*Banded	4 x 1	C
*Banded	4 x 1 1/4	C
*Banded	4 x 1 1/2	C
*Banded	4 x 2	C
*Banded	4 x 2 1/2	C
*Banded	4 x 3	C
*Banded	4 x 3 1/2	C

In ordering, be particular to mention Banded or Plain, Black or Galvanized.

Such sizes as are marked with an * are also carried in stock Galvanized.

MALLEABLE IRON FITTINGS

REVISED CLASSIFICATION, CONTINUED

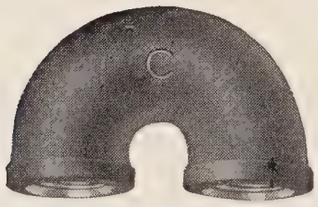
RETURN BENDS

CLOSE PATTERN

Size	Dist. between Centers	R. H. Class	R. & L. Class
½	1	*B	*A
¾	1¼	*B	*B
1	1½	*B	*B
1¼	1¾	*C	*B
1½	2 3/16	*C	*B
2	2 5/8	*C	*B

MEDIUM PATTERN

Size	Dist. between Centers	R. H. Class	R. & L. Class
½	1¼	*B	A
¾	1½	*B	*B
1	1 7/8	*B	*B
1¼	2¼	*C	B
1½	2½	*C	B
2	3	*C	B

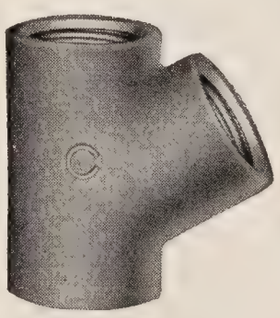


OPEN PATTERN

Size	Dist. between Centers	R. H. Class	R. & L. Class
½	1½	*B	A
¾	2	*B	*B
1	2½	*B	*B
1¼	3	*C	*B
1½	3½	*C	*B
2	4	*C	*B
2½	4½	*C	B
3	5	*C	B

Y BENDS

	Size	Class
Banded	⅜x ⅜x ⅜	A
*Banded	½x ½x ½	B
*Banded	¾x ¾x ¾	B
Banded	1 x1 x ¾	B
*Banded	1 x1 x1	B
Banded	1¼x1¼x1	B
*Banded and Plain	1¼x1¼x1¼	B
Banded	1¼x1¼x ¾	B
*Banded and Plain	1½x1¼x1¼	B
*Banded and Plain	1½x1¼x1½	B
Banded	1½x1½x1	B
*Banded and Plain	1½x1½x1¼	B
*Banded and Plain	1½x1½x1½	B
*Banded	2 x1¼x1¼	B
*Banded and Plain	2 x1¼x1½	B
*Banded and Plain	2 x1¼x2	B
*Banded and Plain	2 x1½x1¼	B
*Banded and Plain	2 x1½x1½	B
*Banded and Plain	2 x1½x2	B
Banded	2 x2 x1	B
*Banded and Plain	2 x2 x1¼	B
*Banded and Plain	2 x2 x1½	B
*Banded and Plain	2 x2 x2	B
*Banded	2½x2½x2	B
*Banded and Plain	2½x2½x2½	B
*Banded	3 x3 x2½	B
*Banded	3 x3 x3	B
*Banded	4 x4 x4	B



60° Y BENDS

*Plain	2	x2	x2	B
*Plain	2	x2	x1½	B

In ordering, be particular to mention Banded or Plain, Black or Galvanized Such sizes as are marked with an * are also carried in stock Galvanized.

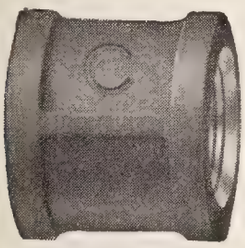
MALLEABLE IRON FITTINGS

REVISED CLASSIFICATION, CONTINUED

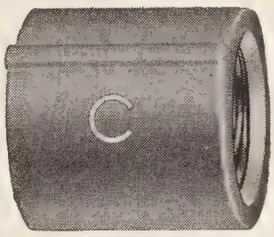
COUPLINGS

RIGHT AND LEFT

Size	Class
* 1/4	B
* 3/8	B
* 1/2	B
* 3/4	B
*1	C
*1 1/4	C
*1 1/2	C
*2	C
*2 1/2	C
*3	C



BANDED



PLAIN

RIGHT HAND

	Size	Class
*Banded and Plain.....	1/4	B
*Banded and Plain.....	3/8	B
*Banded and Plain.....	1/2	B
*Banded and Plain.....	3/4	B
*Banded and Plain.....	1	C
*Banded and Plain.....	1 1/4	C
*Banded and Plain.....	1 1/2	C
*Banded and Plain.....	2	C
*Banded.....	2 1/2	C
*Banded.....	3	C
Banded.....	3 1/2	C
Banded.....	4	C

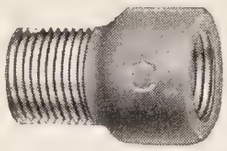
OFFSETS

All Sizes, 3/4, 1 and 1 1/4.....Class B

LOCK NUTS

Size	Class
1/8	A
* 1/4	B
* 3/8	B
* 1/2	B
* 3/4	B
*1	B
*1 1/4	B
*1 1/2	C
*2	C

EXTENSION PIECES



MALE AND FEMALE

Size	Class
*3/8 x 3/8	B
*1/2 x 1/2	B
*3/4 x 3/4	B
1 x1	B
1 1/4 x1 1/4	B
1 1/2 x1 1/2	B
2 x2	B

WASTE NUTS

PLAIN

Size	Class
* 1/4	B
* 3/8	B
* 1/2	B
* 3/4	B
*1	B
*1 1/4	B
*1 1/2	B

CHANDELIER LOOPS

MALE

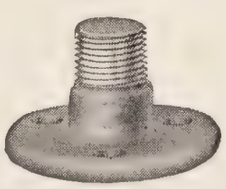
Size	Class
3/8	B
1/2	B

CHANDELIER HOOKS

MALE OR FEMALE

Size	Class
3/8	B
1/2	B

WALL PLATES



Size	Class
3/8	B
1/2	B
3/4	B

In ordering, be particular to mention Banded or Plain, Black or Galvanized. Such sizes as are marked with an * are also carried in stock Galvanized.

LIST OF SIZES

EXTRA HEAVY

MALLEABLE IRON FITTINGS

FOR STEAM WORKING PRESSURES UP TO 250 POUNDS

The following Straight and Reducing Fittings are carried in stock. Other sizes will be made to order by bushing in the sand from straight patterns, at a special price.

ELBOWS

1/4 x 1/4	1 x 3/4	1 1/2 x 1 1/4	2 x 3/4	3 x 2 1/2
3/8 x 3/8	1 1/4 x 1 1/4	1 1/2 x 1	2 x 1/2	3 x 2
1/2 x 1/2	1 1/4 x 1	2 x 2	2 1/2 x 2 1/2	3 1/2 x 3 1/2
3/4 x 3/4	1 1/4 x 3/4	2 x 1 1/2	2 1/2 x 2	4 x 4
3/4 x 1/2	1 1/4 x 1/2	2 x 1 1/4	2 1/2 x 1 1/2	5 x 5
1 x 1	1 1/2 x 1 1/2	2 x 1	3 x 3	6 x 6

45° ELBOWS

1/4	3/4	1 1/2	3	5
3/8	1	2	3 1/2	6
1/2	1 1/4	2 1/2	4	

TEES

1/4 x 1/4 x 1/4	1 x 1 x 1	1 1/2 x 1 1/2 x 1 1/4	2 x 1 1/2 x 2	4x4x4
3/8 x 3/8 x 3/8	1 x 1 x 3/4	1 1/2 x 1 1/2 x 1	2 x 1 x 2	4x4x3
1/2 x 1/2 x 1/2	1 x 1 x 1/2	1 1/2 x 1 1/2 x 3/4	2 1/2 x 2 1/2 x 2 1/2	4x4x2 1/2
1/2 x 3/8 x 1/2	1 x 3/4 x 1	1 1/2 x 1 1/2 x 1/2	2 1/2 x 2 1/2 x 2	4x4x2
3/4 x 3/4 x 3/4	1 1/4 x 1 1/4 x 1 1/4	1 1/2 x 1 1/4 x 1 1/2	2 1/2 x 2 1/2 x 1 1/2	4x3x4
3/4 x 3/4 x 1/2	1 1/4 x 1 1/4 x 1	2 x 2 x 2	2 1/2 x 2 x 2 1/2	5x5x5
	1 1/4 x 1 1/4 x 3/4	2 x 2 x 1 1/2	3 x 3 x 3	5x5x4
	1 1/4 x 1 1/4 x 1/2	2 x 2 x 1 1/4	3 x 3 x 2	6x6x6
	1 1/4 x 1 x 1 1/4	2 x 2 x 1	3 x 3 x 1 1/2	6x6x4
	1 1/4 x 1 x 1	2 x 2 x 3/4	3 x 2 x 3	6x6x3
	1 1/2 x 1 1/2 x 1 1/2	2 x 2 x 1/2	3 1/2 x 3 1/2 x 3 1/2	

CROSSES

1/4	1	2 1/2	4
3/8	1 1/4	3	5
1/2	1 1/2	3 1/2	6
3/4	2		

45° Elbows and Crosses are not carried in stock in Reducing sizes, but will be made to order by bushing in the sand from such patterns as we have, at a special price, according to quantity wanted.

For price list of Extra Heavy Malleable Fittings, see page 329.

For fittings larger than 6 inches, see page 339.

For general dimensions of Extra Heavy Malleable Iron Fittings, see page 645.

LIST OF SIZES

HYDRAULIC

MALLEABLE IRON FITTINGS

FOR WATER WORKING AND TEST PRESSURES, SEE PAGE 330

The following Straight and Reducing Fittings are carried in stock. Other sizes will be made to order by bushing in the sand from straight patterns, at a special price.

ELBOWS

1/4 x 1/4	1 x 3/4	1 1/2 x 1 1/4	2 x 3/4	3 x 2 1/2
3/8 x 3/8	1 1/4 x 1 1/4	1 1/2 x 1	2 x 1/2	3 x 2
1/2 x 1/2	1 1/4 x 1	2 x 2	2 1/2 x 2 1/2	3 1/2 x 3 1/2
3/4 x 3/4	1 1/4 x 3/4	2 x 1 1/2	2 1/2 x 2	4x4
3/4 x 1/2	1 1/4 x 1/2	2 x 1 1/4	2 1/2 x 1 1/2	5x5
1 x 1	1 1/2 x 1 1/2	2 x 1	3 x 3	6x6

45° ELBOWS

1/4	1	2 1/2	5
3/8	1 1/4	3	6
1/2	1 1/2	3 1/2	
3/4	2	4	

LONG SWEEP ELBOWS

1	2	3 1/2	6
1 1/4	2 1/2	4	
1 1/2	3	5	

TEES

3/4 x 3/4 x 3/4	1 1/4 x 1 1/4 x 1/2	2 x 2 x 2	2 1/2 x 2 1/2 x 2	4x4x3
3/4 x 3/4 x 1/2	1 1/4 x 1 x 1 1/4	2 x 2 x 1 1/2	2 1/2 x 2 1/2 x 1 1/2	4x4x2 1/2
1 x 1 x 1	1 1/4 x 1 x 1	2 x 2 x 1 1/4	2 1/2 x 2 x 2 1/2	4x4x2
1 x 1 x 3/4	1 1/2 x 1 1/2 x 1 1/2	2 x 2 x 1	3 x 3 x 3	4x3x4
1 x 1 x 1/2	1 1/2 x 1 1/2 x 1 1/4	2 x 2 x 3/4	3 x 3 x 2	5x5x5
1 x 3/4 x 1	1 1/2 x 1 1/2 x 1	2 x 2 x 1/2	3 x 3 x 1 1/2	5x5x4
1 1/4 x 1 1/4 x 1 1/4	1 1/2 x 1 1/2 x 3/4	2 x 1 1/2 x 2	3 x 2 x 3	6x6x6
1 1/4 x 1 1/4 x 1	1 1/2 x 1 1/2 x 1/2	2 x 1 x 2	3 1/2 x 3 1/2 x 3 1/2	6x6x4
1 1/4 x 1 1/4 x 3/4	1 1/2 x 1 1/4 x 1 1/2	2 1/2 x 2 1/2 x 2 1/2	4x4x4	6x6x3

1/4 x 1/4 x 1/4
3/8 x 3/8 x 3/8
1/2 x 1/2 x 1/2
1/2 x 3/8 x 1/2

CROSSES

1/4	3/4	1 1/2	3	5
3/8	1	2	3 1/2	6
1/2	1 1/4	2 1/2	4	

REDUCERS

3/8 x 1/4	1 1/4 x 1	1 1/2 x 3/4	2 x 1/2
1/2 x 3/8	1 1/4 x 3/4	1 1/2 x 1/2	2 1/2 x 2
3/4 x 1/2	1 1/4 x 1/2	2 x 1 1/2	3 x 2 1/2
1 x 3/4	1 1/2 x 1 1/4	2 x 1 1/4	3 x 2
1 x 1/2	1 1/2 x 1	2 x 1	3 x 1 1/2

Long Sweep Elbows, 45° Elbows and Crosses are not carried in stock in Reducing Sizes, but will be made to order by bushing in the sand from such patterns as we have at a special price, according to quantity wanted.

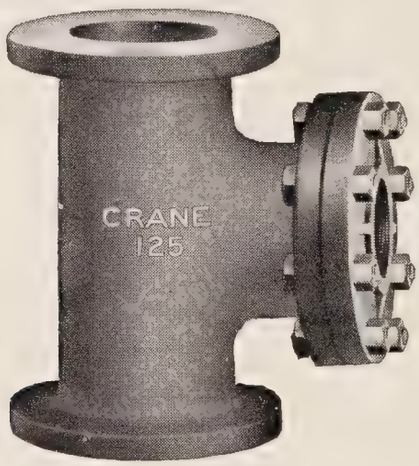
For price list of Hydraulic Malleable Iron Fittings, see page 330.

For fittings larger than 6 inches, see page 339.

For general dimensions of Hydraulic Malleable Iron Fittings, see page 646.

STANDARD

REDUCING FLANGED FITTINGS



It is not possible to carry in stock a line of Reducing Flanged Fittings sufficiently large to meet all demands promptly. We aim to carry a complete line of straight sizes, and an extensive line of reducing sizes, as given on pages 717 and 718.

To avoid delay, we carry in stock a line of

REDUCING RIBBED FLANGES AS SHOWN ON PAGE 473

These Flanges, used in connection with straight or reducing fittings carried in stock, enable us to fill orders for reducing sizes very promptly.

CUSTOMERS WHO DESIRE FITTINGS REDUCED IN THIS MANNER WILL PLEASE SPECIFY "REDUCE BY FLANGES IF NECESSARY"

These Flanges will always be the same thickness as the regular Companion Flanges of corresponding outside diameter.

The Flanges are always drilled to the template corresponding to the outside diameter, unless otherwise ordered.

IN ORDERING REDUCING COMPANION FLANGES

always give the screwed or reduced size first, then the outside diameter of Flange wanted; for instance, if a Reducing Flange is required to connect a 6 inch pipe to a 9 inch Flanged Valve or Fitting, having a 15 inch O. D. Flange,

ORDER A 6 X 15 REDUCING FLANGE

This will clearly avoid confusion often caused by orders incorrectly calling for a 9x6 or a 6x9 Flange.

LIST OF SIZES

STANDARD CAST IRON

REDUCING FLANGED FITTINGS

CARRIED IN STOCK

No. 531. REDUCING FLANGED TEES

2 x2 x1½
2½x2½x2
2½x2½x1½
2½x2 x1½

3 x3 x2½
3 x3 x2
3 x3 x1½
3 x3 x1¼
3 x3 x1
3 x2½x3
3 x2½x2½
3 x2½x2
3 x2 x3
3 x2 x2½
3 x2 x2
2½x2½x3

3½x3½x3
3½x3½x2½
3½x3½x2
3½x2½x2½

4 x4 x3½
4 x4 x3
4 x4 x2½
4 x4 x2
4 x4 x1½
4 x4 x1¼
4 x3½x4
4 x3 x4
4 x2½x4
4 x2 x4
4 x3 x3
4 x3 x2½
4 x3 x2
4 x2½x3
4 x2½x2½
4 x2 x2
3 x3 x4
2½x2½x4

4½x4½x4
4½x4½x3
4½x4½x2½

5 x5 x4
5 x5 x3½
5 x5 x3
5 x5 x2½
5 x5 x2
5 x5 x1½
5 x5 x1¼
5 x4 x5
5 x3 x5
5 x2½x5

5x2 x5
5x4 x4
5x4 x3
5x4 x2½
5x4 x2
5x3½x4
5x3 x3½
5x3 x3
4x4 x5

6x6 x5
6x6 x4½
6x6 x4
6x6 x3½
6x6 x3
6x6 x2½
6x6 x2
6x6 x1½
6x5 x6
6x4 x6
6x3 x6
6x3 x4
6x3 x3
6x2½x6
6x2 x6
6x5 x5
6x5 x4
6x5 x3
6x5 x2½
6x4 x5
6x4 x4
6x4 x3
6x4 x2½
5x5 x6
5x4 x6
4x4 x6

7x7 x6
7x7 x5
7x7 x4
7x7 x3½
7x7 x3
7x7 x2½
7x7 x2
7x6 x7
7x5 x7
7x5 x5
7x4 x7
7x3 x7
7x6 x6
7x6 x5
6x6 x7
5x5 x7

8x8 x7
8x8 x6
8x8 x5

8x 8 x 4½
8x 8 x 4
8x 8 x 3½
8x 8 x 3
8x 8 x 2½
8x 8 x 2
8x 7 x 8
8x 6 x 8
8x 5 x 8
8x 4 x 8
8x 3½x 8
8x 3 x 8
8x 7 x 7
8x 7 x 6
8x 7 x 5
8x 7 x 4
8x 6 x 6
8x 6 x 5
8x 6 x 4
8x 6 x 3
8x 5 x 7
8x 5 x 6
8x 5 x 6
8x 4 x 6
8x 4 x 4
7x 7 x 8
6x 6 x 8
5x 5 x 8

9x 9 x 8
9x 9 x 7
9x 9 x 6
9x 9 x 5
9x 9 x 4
9x 9 x 3
9x 9 x 2½
9x 6 x 6

10x10 x 9
10x10 x 8
10x10 x 7
10x10 x 6
10x10 x 5
10x10 x 4½
10x10 x 4
10x10 x 3½
10x10 x 3
10x10 x 2½
10x10 x 2
10x 8 x10
10x 7 x10
10x 6 x10
10x 5 x10
10x 4 x10
10x 3 x10
10x 8 x 8

10x 8x 7
10x 8x 6
10x 8x 5
10x 8x 4
10x 7x 7
10x 6x 8
10x 6x 6
8x 8x10
8x 6x10
6x 6x10

12x12x10
12x12x 9
12x12x 8
12x12x 7
12x12x 6
12x12x 5
12x12x 4½
12x12x 4
12x12x 3
12x12x 2
12x10x12
12x 8x12
12x 6x12
12x 4x12
12x10x10
12x10x 8
12x10x 6
12x 8x10
12x 8x 8
12x 8x 6
12x 6x 8
10x10x12
8x 8x12

14x14x12
14x14x10
14x14x 9
14x14x 8
14x14x 7
14x14x 6
14x14x 5
14x14x 4
14x12x14
14x12x12
14x10x10
10x10x14

16x16x14
16x16x12
16x16x10
16x16x 8
16x16x 7
16x16x 6
16x12x12
12x12x16

(CONTINUED ON FOLLOWING PAGE)

LIST OF SIZES

STANDARD CAST IRON

REDUCING FLANGED FITTINGS

CARRIED IN STOCK

(CONTINUED)

No. 535. REDUCING SINGLE SWEEP FLANGED TEES

4x4x2	6x6x2½	8x8x3	10x10x6
6x6x5	8x8x6	8x6x6	10x8x8
6x6x4	8x8x5	8x6x4	10x6x6
6x6x3			

No. 536. REDUCING DOUBLE SWEEP FLANGED TEES

4x4x2	6x6x3	10x10x8	10x10x5
6x6x5	8x8x6	10x10x6	10x10x4
6x6x4			

No. 539. REDUCING FLANGED CROSSES

4x4x3x3	6x6x5x5	8x8x5x5	8x6x8x6
5x5x4x4	6x6x4x4	8x8x4x4	10x10x8x8
5x5x3x3	6x6x3x3	8x8x3x3	10x10x6x6
5x5x2½x2½	8x8x6x6	8x6x6x6	10x10x5x5
6x6x6x4			

No. 543. REDUCING FLANGED LATERALS

4x4x2½	8x8x6	10x10x8
6x6x4	8x6x6	10x10x6
6x6x3	8x8x3	10x8x8
6x6x2½		

These sizes as listed above and on page 717 with our Special Reducing Companion Flanges, enable us to furnish from stock about every variety of Fittings required, except Special Angles, Offsets, etc.

Reducing Ribbed Flanges are carried in stock as per table, page 473. These Flanges will always be the same thickness as the regular Companion Flanges of corresponding outside diameter.

The Flanges are always drilled to the template corresponding to the outside diameter unless otherwise ordered.

Customers who desire Fittings reduced by the use of Companion Flanges will please specify "Reduce by Flanges if necessary."

PRICES OF SIZES NOT CARRIED IN STOCK

SIZES NOT COVERED IN THE LIST OF SIZES CARRIED IN STOCK, AS GIVEN ABOVE AND ON PAGE 717 WILL BE CONSIDERED SPECIAL AND MADE TO ORDER AT THE FOLLOWING ADVANCE IN PRICES, ACCORDING TO THE QUANTITY OF A SIZE ORDERED AT ONE TIME, VIZ.:

ADD TO THE REGULAR LIST PRICES OF REDUCING FLANGE FITTINGS ON PAGES 427 AND 429 THE PERCENTAGE ADVANCES GIVEN BELOW

SIZE	1 Piece	2 Pieces	3 Pieces	4 Pieces	5 Pieces	6 or More
3½-Inch and Smaller	100%	80%	60%	40%	20%	No Advance
4 to 8-Inch.....	50%	40%	30%	20%	10%	No Advance
9 and 10-inch.....	25%	20%	15%	10%	5%	No Advance

SIZES 12-INCH AND LARGER WILL BE MADE TO ORDER IN QUANTITIES OF ONE OR MORE OF A SIZE, AT THE REGULAR LIST AND DISCOUNT.

We do not make Single Sweep Tees with side openings larger than the run.

Double Sweep Tees are not made reducing on the run. Should such Tees, however, be wanted we will alter patterns (which will be expensive) and charge at a special price.

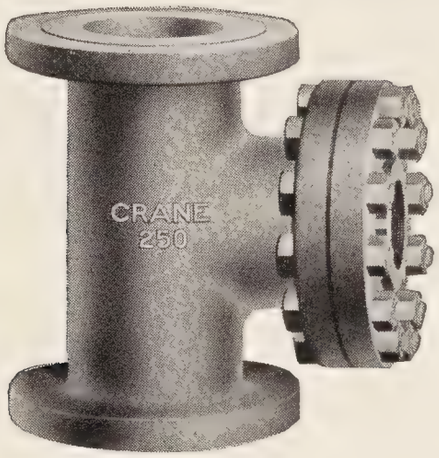
On Double Sweep Tees, we can only increase branch (outlet) within a reasonable limit, which must be regulated by our patterns.

Furnished faced only, unless otherwise ordered.

General dimensions, pages 652 to 655. Templates for drilling, page 596.

EXTRA HEAVY

REDUCING FLANGED FITTINGS



It is not possible to carry in stock a line of Reducing Flanged Fittings sufficiently large to meet all demands promptly. We aim to carry a complete line of Straight sizes and an extensive line of Reducing sizes, as given on pages 720 and 721.

To avoid delay, we carry in stock a line of

REDUCING RIBBED FLANGES AS SHOWN ON PAGE 475

These flanges, used in connection with Straight or Reducing Fittings carried in stock, enable us to fill orders for Reducing Sizes very promptly.

CUSTOMERS WHO DESIRE FITTINGS REDUCED IN THIS MANNER WILL PLEASE SPECIFY "REDUCE BY FLANGES IF NECESSARY."

These Flanges will always be the same thickness as the Regular Companion Flanges of corresponding outside diameter.

The Flanges are always drilled to the template corresponding to the outside diameter, unless otherwise ordered.

IN ORDERING REDUCING COMPANION FLANGES

always give the screwed or reduced size first, then the outside diameter of Flange wanted; for instance, if a Reducing Flange is required to connect a 6-inch pipe to a 9-inch Flanged Valve or Fitting, having a 16¼-inch O. D. Flange,

ORDER A 6x16¼ REDUCING FLANGE.

This will clearly avoid confusion often caused by orders incorrectly calling for a 9x6 or a 6x9 Flange.

LIST OF SIZES

EXTRA HEAVY CAST IRON

REDUCING FLANGED FITTINGS

CARRIED IN STOCK

No. 107 E, REDUCING FLANGED TEES

2½x2½x2
2½x2½x1½
2½x2½x1¼
2½x2x2
3x3x2½
3x3x2
3x3x1½
3x3x1¼
3x3x1
3x2½x3
3x2x3
3x1½x3
3x1¼x3
3x2½x2½
3x2x2
2x2x3

3½x3½x2½
3½x3½x2
3½x2½x3½

4x4x3½
4x4x3
4x4x2½
4x4x2
4x4x1½
4x3x4
4x2½x4
4x2x4
4x3x3
4x3x2
4x3x1½
4x2½x2½
4x2x3
3x3x4
2½x2½x4

4½x4½x3
4½x4½x2
4½x4x4½

5x5x4
5x5x3½
5x5x3
5x5x2½
5x5x2
5x5x1½
5x4x5
5x3x5
5x2½x5
5x4x4
5x4x3
5x4x2½
5x3x4
5x3x3
4x4x5

6x6x5
6x6x4½
6x6x4
6x6x3½
6x6x3
6x6x2½
6x6x2
6x5x6
6x4x6
6x3x6
6x2½x6
6x5x5
6x5x4
6x5x3
6x5x2½
6x5x2
6x4x5
6x4x4
6x4x3
6x3x3
5x5x6
4½x4½x6
4x4x6

7x7x6
7x7x5
7x7x4
7x7x3
7x7x2
7x6x7
7x6x6
7x5x5
6x6x7

8x8x7
8x8x6
8x8x5
8x8x4½
8x8x4
8x8x3½
8x8x3
8x8x2½
8x8x2
8x6x8
8x4x8
8x3x8
8x7x6
8x7x5
8x6x7
8x6x6
8x6x5
8x6x4
8x5x6
8x5x5
8x4x6
8x4x4
6x6x8
5x5x8

9x9x6
9x9x5

10x10x8
10x10x7
10x10x6
10x10x5
10x10x4½
10x10x4
10x10x3½
10x10x3
10x10x2
10x8x10
10x6x10
10x8x8
10x8x6
10x8x5
10x6x8
10x6x6
8x8x10
7x7x10

12x12x10
12x12x9
12x12x8
12x12x7
12x12x6
12x12x5
12x12x4
12x12x3
12x12x2½
12x10x12
12x8x12
12x10x10
12x10x8
12x10x6
12x8x8
12x8x6
10x10x12
8x8x12

14x14x12
14x14x10
14x14x8
14x14x7
14x14x6
14x14x5
14x12x8

16x16x10
16x16x8
16x16x7
16x16x6

(CONTINUED ON OPPOSITE PAGE)

LIST OF SIZES

EXTRA HEAVY CAST IRON

REDUCING FLANGED FITTINGS

CARRIED IN STOCK

(CONTINUED)

No. 111 E, REDUCING SINGLE SWEEP FLANGED TEES

4x4x2½	6x6x4	8x8x6
4x4x2	6x4x4	8x6x6

No. 112½ E, REDUCING DOUBLE SWEEP FLANGED TEES

4x4x2½	5x5x3	8x8x6
4x4x2	6x6x4	8x8x5
5x5x4	6x6x3	8x8x4

No. 115 E, REDUCING FLANGED CROSSES

3x3x2½x2½	8x8x6x6
4x4x2½x2½	8x8x5x5
6x6x4x4	8x8x4x4
6x6x3x3	

No. 119 E, REDUCING FLANGED LATERALS

4x4x2½	6x6x2½

These sizes as listed above and on page 720 with our Special Reducing Companion Flanges, enable us to furnish from stock about every variety of fittings required, except Special Angles, Offsets, etc.

Reducing Ribbed Flanges are carried in stock as per table on page 475. These Flanges will always be the same thickness as the regular Companion Flanges of corresponding outside diameter.

The Flanges are always drilled to the template corresponding to the outside diameter, unless otherwise ordered.

Customers who desire Fittings reduced by the use of reducing Companion Flanges, will please specify "Reduce by Flanges if necessary."

PRICES OF SIZES NOT CARRIED IN STOCK

SIZES NOT COVERED IN THE LIST OF SIZES CARRIED IN STOCK, AS GIVEN ON PAGES 720 AND 721 WILL BE CONSIDERED SPECIAL AND MADE TO ORDER AT THE FOLLOWING ADVANCE IN PRICES, ACCORDING TO THE QUANTITY OF A SIZE ORDERED AT ONE TIME, VIZ:

ADD TO THE REGULAR LIST PRICES OF REDUCING FLANGED FITTINGS, PAGES 443 AND 445, THE PERCENTAGE ADVANCES GIVEN BELOW.

SIZE	1 Piece	2 Pieces	3 Pieces	4 Pieces	5 Pieces	6 or More
3½-Inch and Smaller	50%	40%	30%	20%	10%	No Advance
4 to 8-Inch.....	25%	20%	15%	10%	5%	No Advance

SIZES 9 INCHES AND LARGER, WILL BE MADE TO ORDER IN QUANTITIES, OF ONE OR MORE OF A SIZE, AT THE REGULAR LIST AND DISCOUNT.

We do not make Single Sweep Tees with side openings larger than the run.

Double Sweep Tees are not made reducing on the run. Should such Tees, however, be wanted, we will alter patterns (which will be expensive) and charge at a special price. On double Sweep Tees, we can only increase branch (outlet) within a reasonable limit, which must be regulated by our patterns.

Furnished faced only, unless otherwise ordered.

General dimensions, pages 656 to 659. Templates for drilling, page 598.

TELEGRAPH CODE

TABLE OF SIZES, FRACTIONS, DIMENSIONS, ETC.

INCHES

1/64...SABACHUS
1/32...SABACORUM
3/64...SABACTHANI
1/16...SABADATO
5/64...SABADEADAS
3/32...SABADEAMOS
7/64...SABADEANDO
1/8...SABADEARIA
9/64...SABADEASTE
5/32...SABADICO
11/64...SABADIGLIA
3/16...SABADILINA
13/64...SABADILL
7/32...SABAISME
15/64...SABAITA
1/4...SABAJAM
17/64...SABAJARIUM
9/32...SABALARES
19/64...SABALERA
5/16...SABANAS
21/64...SABANDIJA
11/32...SABANEABAN
23/64...SABANEARON
3/8...SABANILLAS
25/64...SABANONES
13/32...SABANPUTE
27/64...SABARBARES
7/16...SABATARIAS
29/64...SABATENUM
15/32...SABATESIMO
31/64...SABATICHE
1/2...SABATICOS
33/64...SABATINIUS
17/32...SABATRINE
35/64...SABAUDIA
9/16...SABBATAIRE
37/64...SABBATDAG
19/32...SABBATFRAU
39/64...SABBATHER
5/8...SABBATHWEG
41/64...SABBATIQUE
21/32...SABBURAM
43/64...SABDARIFFA
11/16...SABECHOSO
45/64...SABEDORAS
23/32...SABEGHE
47/64...SABELBOHNE
3/4...SABELCHEN
49/64...SABELDUELL
25/32...SABELFINNE
51/64...SABELGRIFF
13/16...SABELHAFER
53/64...SABELHOUW
27/32...SABELIANA
55/64...SABELICAS
7/8...SABELKLING
57/64...SABELKNOP
29/32...SABELKORB
59/64...SABELKRUMM
15/16...SABELKWAST
61/64...SABELLICUM
31/32...SABELMOF
63/64...SABELNARBE
1 ....SABELPELS
1 1/8....SABELPUNT
1 1/4....SABENBAUM
1 3/8....SABERBILL
1 1/2....SABERWING
1 5/8....SABIAMENTE
1 3/4....SABIANISM
1 7/8....SABICHONAS
2 ....SABICUWOOD
2 1/8....SABIDILLOS
2 1/4....SABIDORES
2 3/8....SABIHONDOS
2 1/2....SABINARUM
2 5/8....SABINENSIS
2 3/4....SABINISCH
2 7/8....SABLABAMUS
3 ....SABLABATUR
3 1/8....SABLABUNT
3 1/4....SABLAMINI
3 3/8....SABLANTIUM
3 1/2....SABLASSENT
3 5/8....SABLAVERAS
3 3/4....SABLERAIT
3 7/8....SABLERONT
4 ....SABLEUX
4 1/8....SABLONNANT
4 1/4....SABOGALES
4 3/8....SABONETA
4 1/2....SABONKEGEL
4 5/8....SABORDAIT
4 3/4....SABORDERAS
4 7/8....SABOREADOR
5 ....SABOREANDA
5 1/8....SABOREARAN
5 3/16....SABOREAVAM
5 1/4....SABORGABA
5 3/8....SABORGAMOS
5 1/2....SABORGARIA
5 5/8....SABORGASEN
5 3/4....SABORGASTE
5 7/8....SABORGUEN
6 ....SABOTAMES
6 1/8....SABOTANTE
6 1/4....SABOTERONT
6 3/8....SABOTIRST
6 1/2....SABOULADE
6 5/8....SABOULASSE
6 3/4....SABRADEN
6 7/8....SABRAINHO
7 ....SABRAMOLLE
7 1/8....SABRETACHE
7 1/4....SABROSICAS
7 3/8....SABROSILLO
7 1/2....SABTECHAH
7 5/8....SABUESAS
7 3/4....SABUJICE
7 7/8....SABULAIRE
8 ....SABULETUM
8 1/8....SABULICOLE
8 1/4....SABULONEM
8 3/8....SABULOSAM
8 1/2....SABULOSITY
8 5/8....SABULOSIUS
8 3/4....SABURANUS
8 7/8....SABURRABAM
9 ....SABURRABIT
9 1/8....SABURRABOR
9 1/4....SABURRALEM
9 3/8....SABURRANDI
9 1/2....SABURRARAT
9 5/8....SABURRARIA
9 3/4....SABURRASEN
9 7/8....SABURRAUX
10 ....SABURRENTO
10 1/8....SACABOCADO
10 1/4....SACABROCAS
10 3/8....SACABUCHE
10 1/2....SACABUXAS
10 5/8....SACADINERO
10 3/4....SACADURA
10 7/8....SACAFILACA
11 ....SACAFUNDO
11 1/8....SACALADOR
11 1/4....SACAMALO
11 3/8....SACAMANTAS
11 1/2....SACAMEDULA
11 5/8....SACAMOLAS
11 3/4....SACAMOLERO
11 7/8....SACAN
12 ....SACANABOS
12 1/2....SACANETES
13.....SACAPENE
14.....SACAPOTRAS
15.....SACARABO
16.....SACARIFICA
17.....SACARIVORO
18.....SACAROLADO
19.....SACAROLHAS
20.....SACAROLOGO
21.....SACASSANI
22.....SACASUELAS
23.....SACATAPON
24.....SACATRAPOS
25.....SACCABAMUS
26.....SACCABANT
27.....SACCABATUR
28.....SACCABIMUR
29.....SACCABITIS
30.....SACCADAIS
31.....SACCADASSE
32.....SACCAGEANT
33.....SACCAGEUR
34.....SACCAGIREN
35.....SACHADURAS
36.....SACHALITES
37.....SACHAMOS
38.....SACHANDA
39.....SACHANSE
40.....SACHARDES
41.....SACHARIAN
42.....SACHARINO
43.....SACHARUM
44.....SACHASEMOS
45.....SACHASSEM
46.....SACHAVAM
47.....SACHBESITZ
48.....SACHBEWEIS
49.....SACHEMDOM
50.....SACHEVEREL
51.....SACHFALLIG
52.....SACHFOLGER
53.....SACHFUHRER
54.....SACHGRUND
55.....SACHHAFTIG
56.....SACHKENNER
57.....SACHKLAGE
58.....SACHKONTEN
59.....SACHKUNDE
60.....SACHLAGEN
66.....SACHOLADA
72.....SACHPROBE
78.....SACHTANGA
84.....SACHTSINN

NOTE:—To express two or more dimensions, whether fractions only, or whole numbers and fractions, code words should follow each other, the words "by" or "and" being understood between them. For instance, in coding Reducing Fittings, the code indicating the Style of Fitting, should follow the code words indicating the sizes:

EXAMPLES

Saberwing Sabenbaum Sabelpels_____.....1½x1¼x1_____
Sabotames Saboreanda Sableux Sabinarum_____.....6x5x4x2½_____
Sabelchen_____.....¾_____

See Page 724 for Phrase Code

TELEGRAPH CODE

TABLES OF NUMERALS

DOLLARS, NUMBERS, QUANTITIES, WEIGHTS, ETC.		CENTS AND DECIMALS	
0.....SAIGERUNG	50.....SAJOTTO	00....SALAMPOSE	.50....SALBANDE
1.....SAIGNAMES	51.....SAKALAVE	.01....SALAMRUBIN	.51....SALBENKRUG
2.....SAIGNASSE	52.....SAKALAWA	.02....SALAMSTONE	.52....SALBENRUCH
3.....SAIGNEMENT	53.....SAKERFALKE	.03....SALANGUET	.53....SALBETAGE
4.....SAIGNERONS	54.....SAKERLOT	.04....SALAPINI	.54....SALBHORN
5.....SAIGNEUX	55.....SAKERVALK	.05....SALAPINUM	.55....SALBLINGES
6.....SAILBURTON	56.....SAKHRAT	.06....SALAPITTAM	.56....SALBRUDER
7.....SAILLANTE	57.....SAKKARA	.07....SALAPITTIS	.57....SALBSTUBEN
8.....SAILLIMES	58.....SAKKERLOOT	.08....SALAPUTIA.	.58....SALBUNGEN
9.....SAILLISSE	59.....SAKRISTAN	.09....SALARIABA	.59....SALCHICHA
10.....SAIMENTO	60.....SAKRISTIJ	.10....SALARIAMES	.60....SALCOCHADO
11.....SAINABAMOS	61.....SAKROSANKT	11....SALARIAMMO	.61....SALCOCHARA
12.....SAINADAS	62.....SAKSAUL	.12....SALARIANLA	.62....SALCOCHESE
13.....SAINADORAS	63.....SAKULAR	.13....SALARIANSE	.63....SALCOCHOME
14.....SAINANDA	64.....SAKULARUHR	.14....SALARIARAN	.64....SALDABLE
15.....SAINANSE	65.....SAKULUM	.15....SALARIAVA	.65....SALDAMENTO
16.....SAINARAN	66.....SAKUNTALA	.16....SALARIBUS	.66....SALDANELLA
17.....SAINAREMOS	67.....SALABILITY	.17....SALARLE	.67....SALDANSE
18.....SAINASES	68.....SALABORDIA	.18....SALASSANTE	.68....SALDAREMOS
19.....SAINASTE	69.....SALACONEM	.19....SALASSATO	.69....SALDASSERO
20.....SAINDOUX	70.....SALACOT	20....SALASSAVA	.70....SALDAVATE
21.....SAINENLO	71.....SALADARES	.21....SALASSERA	.71....SALDENME
22.....SAINETEABA	72.....SALADEBAK	.22....SALASSIDE	.72....SALDIRBUCH
23.....SAINETEADO	73.....SALADEBLAD	.23....SALATARTIG	.73....SALDISSIMO
24.....SAINETEARE	74.....SALADEBOON	.24....SALATBLATT	.74....SALDOCONTO
25.....SAINETILLO	75.....SALADEKOM	.25....SALATBLUTE	.75....SALDUBA
26.....SAINOME	76.....SALADEKROP	.26....SALATBRAND	.76....SALEBRATAM
27.....SAIPHOS	77.....SALADEMAND	.27....SALATESSIG	.77....SALEBREUX
28.....SAIQUE	78.....SALADEROS	.28....SALATFARBE	.78....SALEBROSUM
29.....SAIRANTHE	79.....SALADETIJD	.29....SALATGABEL	.79....SALEGGIANO
30.....SAISISSAIT	80.....SALADETUIN	.30....SALATGODEN	.80....SALEGGIARE
31.....SAISISSONS	81.....SALADEVORK	.31....SALATGURKE	.81....SALEGGIATA
32.....SAISONNAIT	82.....SALADINHA	.32....SALATHAUPT	.82....SALEGGIAVI
33.....SAISONNERA	83.....SALADLO	.33....SALATKOHL	.83....SALEMINHAS
34.....SAISSAL	84.....SALAGANE	.34....SALATKOPF	.84....SALENTINI
35.....SAITICUM	85.....SALAGISA	.35....SALATKORBE	.85....SALENTINUM
36.....SAITIGER	86.....SALAGRAMA	.36....SALATKRAUT	.86....SALERATUS
37.....SAIVALA	87.....SALAISON	.37....SALATKUMME	.87....SALERNUM
38.....SAJADURA	88.....SALAJUOLA	.38....SALATKUMP	.88....SALETJES
39.....SAJANDO	89.....SALALCALI	.39....SALATNAPF	.89....SALETREKEL
40.....SAJANLA	90.....SALAMALEC	.40....SALATRAUPE	.90....SALGADERA
41.....SAJANSE	91.....SALAMANDRA	.41....SALATSAMEN	.91....SALGADINHO
42.....SAJARIAMOS	92.....SALAMANNA	.42....SALATSUNGE	.92....SALGALHADA
43.....SAJELADORA	93.....SALAMBONIS	.43....SALATWADEN	.93....SALGAMORUM
44.....SAJELARIA	94.....SALAMBOREA	.44....SALATWURM	.94....SALHUND
45.....SAJELARON	95.....SALAMEAM	.45....SALAVANCO	.95....SALIAUNCE
46.....SAJELASTE	96.....SALAMEAVA	.46....SALAVOSO	.96....SALICASTRO
47.....SAJETTEN	97.....SALAMINIUM	.47....SALAZONES	.97....SALICOQUE
48.....SAJONIBUS	98.....SALAMISTRO	.48....SALBADERAS	.98....SALICORNES
49.....SAJORNA	99.....SALAMOJE	.49....SALBADERST	.99....SALICORNIA

NOTE:—To express figures larger than 99, give first the code word for the first single or double figures and then code word for the second double figure. For example:

To code the figures 524 use the words "Saigneux Saineteare."

To code the figures 9875 use the words "Salamistro Saladekom."

To code $23.48 use the code words "Saineteado Salbaderas."

See Page 724 for Phrase Code

TELEGRAPH CODE

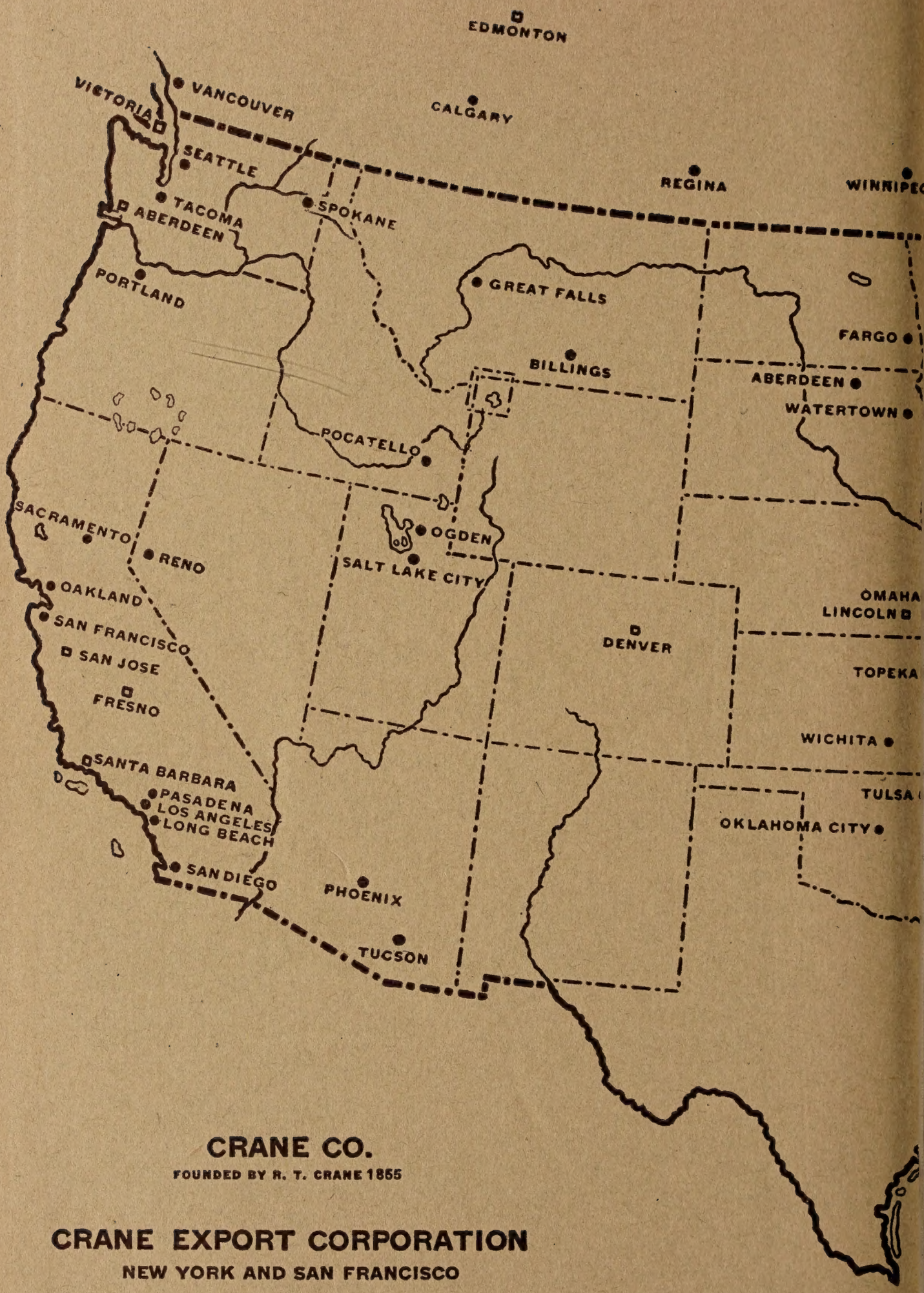
PHRASES

CODE	TRANSLATION
WORTSCHALL..	Add to our order
WORTSCHARF..	All quotations are hereby withdrawn
WORTSCHATZ..	At what price can you furnish
WORTSIGEL....	Can you cancel
WORTSTAMM..	Cannot cancel
WORTSTROM..	Cannot cancel, as goods were shipped on the
WORTTARIF....	Cannot cancel, as material is special and castings made, advise disposition
WORTVORRAT..	Cannot cancel balance of order
WORTWERK....	Have you in stock and can you ship at once
WORTWILLIG..	Have you in stock and can you ship at once, if not, state how soon after receipt of order you can ship the following
WORUNTER....	Have you in stock and can you ship at once, if not, state how soon after receipt of order you can ship, also quote price (s) on the following
WOSELBST.....	Have you in stock and can you ship at once, if so consider this an order and ship the following
WOSTINIA.....	Quote price and delivery by telegraph on the following
WOUDACHTIG..	Must have advice today
WOUDDUIF.....	Referring to our letter of
WOUDDUIVEN..	Referring to our telegram (of)
WOUDFOREL...	Referring to your letter of
WOUDMARTER.	Referring to your telegram (of)
WOUDSCHOUW.	Ship at once
WOUDSTEDEN.	Ship at once by parcel post
WOUDVAREN...	Ship at once by express
WOUDVENKEL.	Ship at once by fast freight
WOUDVOGEL...	Ship by freight
WOUTERMAN..	Ship by local freight
WOUWKUIP....	Ship at once by boat
WOWIDER.....	Ship by local freight with order number
WRACKHOLZ...	Ship in first carload
WRACKSOME...	Ship order————————by express
WRAINSTAFF...	Ship soon as possible
WRAKHOUT....	Ship today
WRAKINGEN...	Ship with first goods coming
WRAKTONNEN	Ship what you have in stock and hold balance for further instructions.
WRANGKRUID.	Telegraph price, weight and how soon you can ship
WRAPRASCAL..	Telegraph ——— direct stating when you can ship
WRASTELER...	We are holding the order for ——— shall we ship balance without them
WRATACHTIG..	We can ship immediately
WRATHINESS...	We cannot ship immediately, but could probably do so in ————
WRATMIDDEL.	We have none in stock, but can ship
WRATTIGER....	When will you ship balance of order number
WRATVORMIG..	When will you ship, answer by wire
WRAWNESS.....	Will ship direct from——
WROKKENDE..	Will obtain particulars and advise by mail
WRONGELEN...	Will obtain particulars and advise by telegraph

MECHANICAL TERMS

CODE	TRANSLATION
WRONGETJE...	Bush in sand from nearest size
WUCHERGELD.	Bush in sand from Standard Pattern
WUCHERHAFT.	Bush in sand from Extra Heavy Pattern
WUCHERJUDE..	Faced only
WUCHERLICH..	Faced and Drilled
WUCHTIGER...	Faced and Drilled and Spot Faced
WUCHTVOLL...	Finished all over
WUCHUCHOL...	Finished and plated all over
WUFTELIJK....	Iron Pipe Thread
WUHLEND	Left hand
WUHLHUBER...	Right hand
WUHLMAUS....	Right and Left
WUHRBAUTE...	Rough body, plain
WULFBALK.....	Rough body, plated all over
WULFBOGEN...	Use Bushings to reduce
WULPENNEST..	With Bolt Holes Spot Faced
WUNDBALSAM.	With Companion Flanges bolted on
WUNDDRUCK..	With Companion Flanges and Bolts loose
WUNDERBAU...	With Companion Flanges Bolts and Gaskets loose

See Pages 722 and 723 for Code of Sizes and Numerals.



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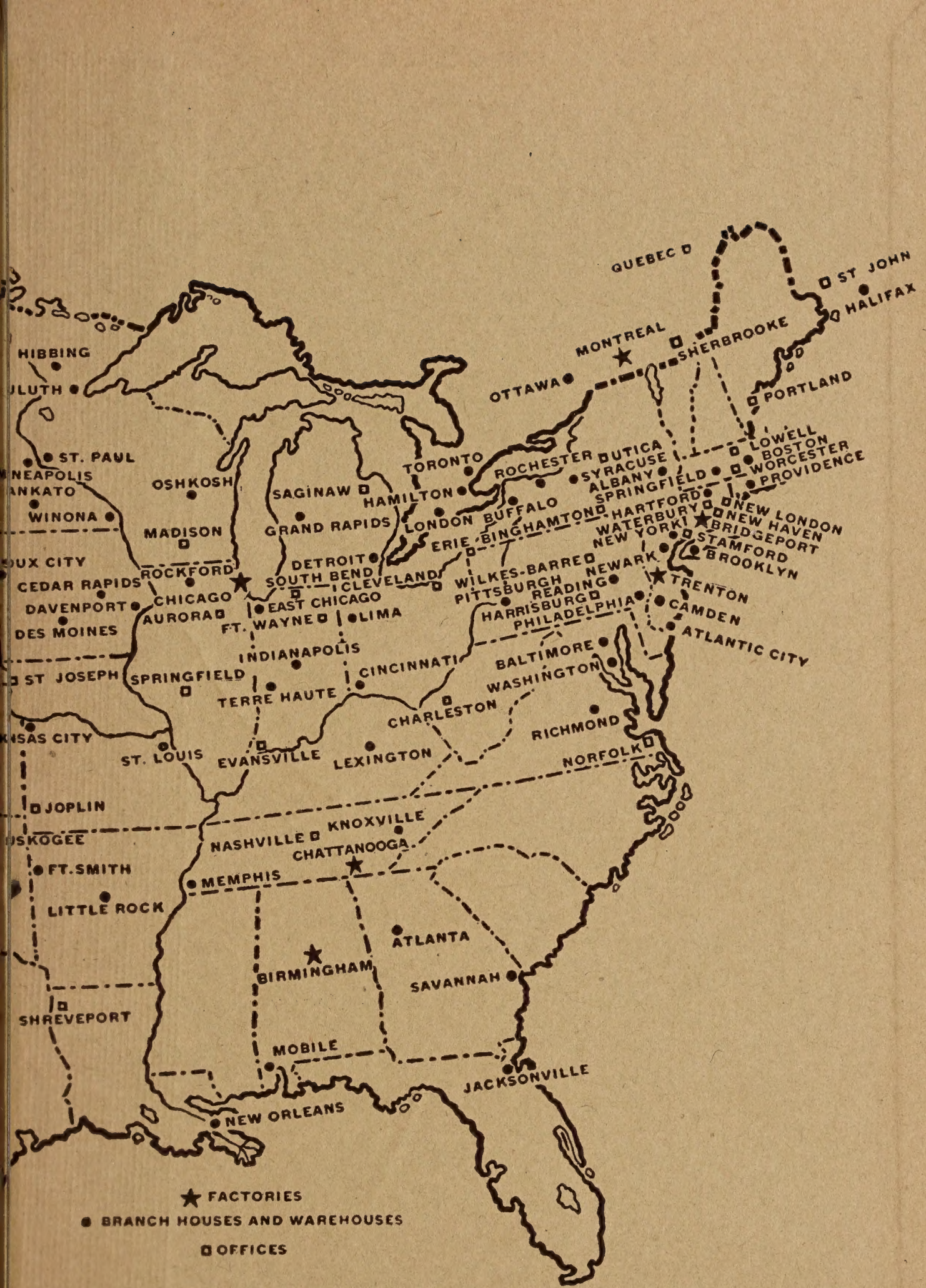

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